

BUSINESS PLANNING SERVICES

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NEWS IN BRIEF

French firms to merge

TWO French companies specialising in terminal systems, Transac and Sintra, are to merge as part of a growth contract signed with the French government. At present the companies, which are both part of the CGE electronics group, produce competitive systems, Transac under licence from Incomet, and Sintra from original designs.

The government growth contracts were announced last year and are granted in return for commitments on growth, employment and exports. Sintra and Transac have agreed on a growth rate of 30% a year and an expansion of exports of 50% a year over the next three years.

Bank gets Amdahl

THE fourth Amdahl 470V/6 in Europe is now up and running at Crédit Suisse in Zürich, where it will run loosely coupled to the bank's three IBM 370/188s.

\$1.5m order

NATIONAL Westminster Bank has ordered 24 NCR 775/2100 multi-pocket proof and encoding systems, and 24 NCR 781 cassettes, valued at nearly £1.5 million. The systems are used in the initial processing of cheques and other documents, including coding the documents with Magnetic Ink Character Recognition, MICR, characters.

On the move

IN a bid to combine most of its London staff under one roof, Univac has moved its offices to Brentfields, opposite Stonebridge Park railway station, Wembley. Its new address is: The Sperry Univac Centre, London NW10 8LS. Tel: 01-865 0511.

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Computer Weekly

Olivetti nears systems goal

WORLDWIDE orders for 13,000 TC 800 terminal systems, worth more than £100 million, point to the increasing success of Olivetti's strategy to establish itself as one of the leading suppliers of data entry and computer network equipment.

The company's turnover is now divided 40-60 between such systems and office products, and the next goal is to achieve a 50-50 divide.

This will be brought nearer by the introduction next year of a text processing system based on the Lexicon "golf ball" print mechanism, the micro floppy disc unit used in the P6080 mini, and new keyboard and memory units.

Major TC 800 orders in the pipeline and at an advanced state of development include a big network for the South African Post Office involving SP 800 minis, and about 500 TC 800s and the new TC 480 printer terminal.

Two major banking orders have come from the Canadian Imperial Bank of

Commerce which is to have a network of 1,400 TC 800s, and 1,000 are to go to the Commercial Bank of Italy. Olivetti is also supplying equipment and helping to develop a terminal network for the Greek Post Office.

Giving details of Olivetti's successes in these fields, its corporate marketing manager, Massimo Samaja, said that in the first eight months of 1977 the group's consolidated turnover had been 745.9 billion lire, (£480 million) an increase of 23.9% on the same period last year. The increase in orders for the same period was 24.9%.

Samaja was speaking at a presentation of two key Scandinavian orders, a network of 180 TC 800s for the STS, the Finnish Workers' Savings Bank; and a network of TC 480 terminals for the Norwegian State Railways.

In the financial field, he said, Olivetti now had 63,000 systems in credit institutions worldwide, and equipment for

the banking market was shortly to be extended with the TC 800 ATS automatic teller system and the DE 700 data entry and transmission systems that were launched at Sicoh in Paris.

Dealing with the question of user resistance to IBM's SNA protocol, Samaja said that an SDLC working prototype was due to go live for an Australian customer by the end of the year, and a second would be installed in Italy shortly afterwards.

Work was also in hand on software to provide for TC 800 connections to the SWIFT network.

The Finnish Savings Bank order was won in competition with Burroughs, Norkie of Finland, Datasah and Philips. IBM dropped out at an early stage because it wanted to provide a complete package and the system was already well established on a dual Burroughs B3500 system. Of the 180 TC 800s ordered, worth a total of about £1,300,000, 136 are already in operation.

CSA shows high cost of privacy

THE costs of complying with proposed legislation aimed at protecting personal information are underlined in technical guidelines drawn up by the Computing Services Association.

And the costs will not be limited to amending computer systems but will also be affected by clerical changes that will be needed.

The guidelines say, "Some of the techniques and methods of work which have been accepted over the years within the organisation for its computer-based systems will have to be changed to meet the new environment."

The changes, says the CSA, could include the introduction of encryption techniques to ensure the privacy of transmission

lines; the systems analysis and programming of changes to systems to bring them in line with legislation; and possible reviews of operating systems to ensure that they meet security criteria.

One significant point highlighted by the CSA is that of giving the individual access to information held on him: "A management and clerical procedure will have to be developed to cope with this inquiry and staff trained to handle it, including identification methods and confirmation of data by the subject. In many cases client as well as employee relationships could be affected by the quality of response."

The Swedish experience, says the CSA, shows that less than 5% of people want to inspect data held on them, which means that for a system with 100,000 personal records there could be 20 inspections and four or fewer corrections in a day.

However, to meet the requirements of the law, it may be necessary to keep a full log on computer files, so that the relevant parts can be found.



The first division of Computer Weekly's summer soccer league was won by Jodup, the London-based Joint Authorities Data Processing Unit of the Home Office and the Metropolitan Police. Its captain, Alan Patterson (right) is seen here receiving the cup from CW editor Malcolm Peltu at a celebration dinner last week. Champions of the second division were recruitment consultants Datacentre who received the Eurologia Cup from Eurologia director Terry Wright. Altergo won the third division Wellerex trophy presented by Graham Hallott, a director of Wellerex.

Improving 370 performance

ANOTHER product aimed at improving the performance of IBM 370 installations has been released in the UK by Wostlinghouse. Known as Paqs (Fast Queueing System), the software was originally developed by US company Goal Systems.

Paqs re-orders the queue of I/O requests to direct-access disc devices, so as to minimise disc-head movement from one request to the next.

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Release of Army's Coral

FURTHER competition in the potentially lucrative Coral 68 market has come from Digital Equipment PDP-11 users.

A Coral compiler for the machine, originally developed at the Royal Military College of Science, Shrivenham, has been made generally available for the first time through Hugh Pughman Associates of Poole, Dorset.

A new division of the company, Hugh Pughman Associates (Compilers) has been formed to market the DEC Coral and to support its existing users.

The division plans to diversify into other languages and other machines, offering source-compatible compilers across a wide range of mini and microprocessor hardware. Next hardware to be approached will be the Computer Automation LSI-2.

The Shrivenham compiler has about 20 current users, mostly developers of software for the Ministry of Defence. These have, until now, been unsupported.

Modems monopoly

FOLLOWING the Post Office concession that TV sets may now include integral modems for Viewdata, John McNulty of Modular Technology, has been advised by the Post Office that the Post Office monopoly on other modems remains intact.

"Perhaps if I gave away cheap Japanese TV sets with each modem, I could get round the problem," comments McNulty.

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Briefing Big DEC price cuts

MANUFACTURING economies have enabled Digital Equipment to cut its prices by up to 21% on eight of its packaged PDP-11 configurations, including discs and operating systems.

The maximum price cuts of each model are — up to 20% on large 11/70 systems; 10% on the large 11/60s; 13% on the small 11/60; 15% on a large 11/34; 21% on a small 11/34; 20% for the 11/44; 18% for a large 11/03; and 18% for a small 11/03.

\$10m order

ORDERS for 10 3032 and 3031 systems, worth a total of £10 million, have been placed with IBM by United Leasing. The company also has two 3033s on order and expects to place most of the machines in Germany. IBM normally operates a first come first served system for hardware reservations, but it is understood orders taken during the first week of marketing of the new machines were consolidated and the delivery sequence decided by lottery.

Crash crisis

HARDWARE and software crashes on the ICL 2980 at the regional computing centre at Edinburgh University are still preventing the centre from providing a full service. The mean time between crashes has increased from 3.9 hours in July (CW, July 14) to 2.9 hours. The situation has been brought to the attention of ICL managing director Geoffrey Cross and is getting special attention.

Burroughs' bid

IN response to IBM's 3031 processor Burroughs's has announced a new 6800 multi-processor model, the 8817. In the US, it has a minimum configuration of 2 Megabytes of main memory and costs \$975,000. Deliveries begin next spring. *Microframe Challenge, Page 48.*

CMC taken over

US MINIMAKER Microdata has completed negotiations to buy 75% of key-to-disc manufacturer CMC UK for \$4 million, but has abandoned plans to buy CMC France and CMC Germany. CMC UK has subsidiaries in Sweden and Denmark and Microdata will market through distributors for the rest of Europe.

Scanner plan

WEST Midland Regional Health Authority seems likely to approve the purchase of a \$20,000 body scanner for Coventry's Warburg Hospital. The authority was recommended at its meeting yesterday (Wednesday) to set aside £100,000. The balance of £20,000 is being raised by public subscription. *Greatest advance Page 20.*

Wang 2200

VIRTUAL storage version of the 2200 series computer has been introduced in the US by Wang Laboratories. Current indications that the machine may be appearing in Europe next month.

BRITISH SUPER

The greater speed in client technology and the discovery of



Strike threat to Govt installations

By Robin Webster

COMPUTERS and computer staff are at the centre of a number of industrial relations problems this week, with a threat to government computer installations by Civil Servants likely to be the most far-reaching.

The Society of Civil and Public Servants, which represents the executive civil service grades, including DP staff, is threatening industrial action unless the government revives an independent pay research unit.

Another civil service union, the Civil and Public Services Association, which represents clerical grade staff, could escalate action in support of the striking air traffic control assistants at West Drayton air traffic control centre following the use of RAF personnel last week to supply fuel for the generators and air conditioning needed for computer and radar equipment at the centre.

And ICL customer engineers have voted in favour of nationwide action if a meeting with ICL management this week proves unsuccessful (page 3).

The SCPS dispute centres around the independent body known as the Pay Research Unit, which used to compile statistics for use in Civil Service pay negotiations with the government.

It was run down in 1975 and the government has said that

before it is restarted certain modifications must be made. These include making the unit more publicly accountable and having staff from outside the Civil Service employed by it.

However, an SCPS spokesman said: "If the unit is not restored within the next two weeks we will have to go ahead and formulate a pay claim and submit it."

Adding to this, Gerry Gillman, general secretary of the union, said: "We would not shrink from taking industrial action. People should not believe that we have no industrial muscle."

"One of the main areas we will be looking at as possible targets are computers," said the SCPS spokesman. "In 1973 we had a dispute with the Post Office and called out the computer programmers in support of the pay claim. It was later calculated that it would have cost the Post Office less to pay our demand in full straight away, and backdate it to the 17th Century."

Areas that may be hit by any industrial action, which could become nationwide, are tax collection, customs and excise, and social security and industrial grant payments.

The strike at West Drayton has been going on for nearly two months (CW, August 25). The centre is used as a civil and military air traffic control base and, according to the Ministry of Defence, the fuel taken in last week was vital to maintain computer equipment, which includes an IBM 8020D

COMPUTER WEEKLY'S INSIDE NEWS

GILB AND ANTI-GILB

Fortnight columnist Tom Gilb, this week comes under attack for his anti-militarist views while Gilb himself provides a few useful tips on database design techniques. *Pages 4 and 6.*

LOH AND REHOLD

How far does the Chinese Lothar go? This week's Inside News translates Chinese into English. *Page 21.*

BRUM BEAT

Tim Palmer and Robin Webster report from Birmingham on the first International Symposium on Computer Music, which seems to be a very lively and interesting event. *Page 22.*

BRITISH SUPER

The greater speed in client technology and the discovery of

ALSO...

Computerworld's DPM and communication. *Page 2.*

Focus on Datafile. *Page 3.*

Niederer has a story. *Page 4.*

Software File. *Page 5.*

Micro News. *Page 6.*

Letters to the Editor. *Page 7.*

250,000 Burroughs net. *Page 8.*

Software File. *Page 9.*

Software File. *Page 10.*

CW ball raises over £1,000 to aid disabled

At Computer Weekly's second annual charity ball last Friday, over 600 people from the computer industry dined and danced at the Royal Lancaster Hotel, and helped raise well over £1,000 for the BCS Specialist Group for the Disabled.

Guest of honour at the ball was the BCS president, Professor Paul Samet, who accepted the contribution to the group's funds from Computer Weekly's editor, Malcolm Peltu. He also announced that the National Computing Centre had donated three training courses to the specialist group. The courses are on video and audio tape and cover FileNet, Cobol programming and the im-

lications of computer systems. They are for use at Stoke Mandeville Hospital where a machine has been presented by Philips. The audio courses can be used on normal cassette recorders and the hospital could make good use of some more units. Anyone who has a recorder or player to give or loan to Stoke Mandeville should contact Derek Nicholson.

Left, Professor Samet chats with two members of the specialist group, Margaret Pearson and Tony Oates. On the left are Professor Samet's wife, Joan, and Christine Higgins, wife of Tony Higgins, Computer Weekly's deputy editor, who organised the ball.

Amdahl top man in UK

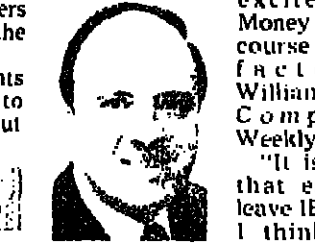
AFTER 17 years with IBM in the UK, latterly as the company's product management manager, Peter Williams has moved over to the competition and has been appointed managing director of Amdahl UK, and general manager, Northern European operations.

"I accepted the post because it is a bigger job than what I was doing with IBM and offers more excitement."

Money was of course also a factor. Williams told Computer Weekly:

"It isn't all that easy to leave IBM, but I think that Gene Amdahl has got an edge on the technology, and I think we will give IBM a run for its money."

Ironically, Williams' last assignment was the launch of the IBM 3032 and 3031 large-scale processors.



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On-Time Systems

NEW WORLD is Citibank Financial Trust's new U.K. computer network. It's an ambitious project — a complete banking system developed from scratch to support terminals at locations throughout the country. Highly cost-effective too, using dual microcomputers rather than a mainframe.

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Editor: Malcolm Peatu 01-261 8033

Deputy Editor: Tony Higgins 01-261 8696

Advertisement Manager: John A. Godley 01-261 8369

Class Ad Manager: Mike White 01-261 8028

Publishing Director: Eric Ickinger

IPC Electrical Electronics
Press Ltd.
Dorset House, Stamford Street,
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Telephone: 01-261 8000
Telex: 25178 BIPR GBranch Offices:
Birmingham
202 Lynton House,
Walsall Road,
Birmingham, B23
Telephone: 021-356 4838Manchester:
Sutton House, Talbot Road,
Salford, Manchester M32
Telephone: 061-872 4211New York:
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Weekly staff may be
contacted directly on the
extensions listed below. Other
departments in Dorset House
may be obtained by dialling
(01) 261 8000.EDITORIAL
Kath Jones 261 8344
Tim Palmer 261 8031
John Kavanagh 261 8026
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Time for the DPM to
communicate with users

WHEN the economic chips are down, as they are now, the DP department can no longer use the mystic aura of technology as its reason for existing. Instead, like all service organisations, it has to market, sell and prove its worth to its customers — its users.

Organisations with DP departments are now being asked to deliver the economic goods, to provide an efficient service which enables the organisation to increase its services productivity, profitability, etc. at a time when it is not possible to spend lavishly on new equipment or on increasing the work force.

Technologically, the DP department is under attack from minis and micros, a situation which threatens to result in information processing anarchy.

Gone are the clear-cut days where a company's spending on computers was solely in the hands of the DP manager. Office managers are now being sold computers in the guise of word processing systems or office machines.

Independently minded managers, tired of the costs, overheads and delays caused by

DP/user workshop

IMPROVING the skills of DP management in communicating with user departments is the main objective of a workshop to be held in London on December 1.

Organised jointly by the Data Processing Management Association and Computer Weekly, the workshop will be run by Nigel Laurie, managing director of Communications Audit.

To ensure that the workshop will be of practical benefit to those attending it, Communications Audit has prepared a survey of user communications techniques which will be used as input to the workshop.

The survey will be sent shortly to all DPMA members; other Computer Weekly readers can obtain a copy of the survey form from the DPMA.

Topics to be covered at the workshop will include examinations of particular communications techniques, such as the use of booklets, house journals, stories and annual reports, as well as an overall

Contenders for Info-Line

AN announcement is expected shortly as to which company will operate the Info-Line information service which is sponsored by The British Library, Department of Industry, Chemical Society, IEE and Derwent Publications (CW, June 16). BOC Datasolve, CRC Information Systems and

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past computer implementations, may now take it into their heads to get their own micro-based system for a few thousand pounds.

That is the main reason why DP managers have supported Professor Dijkstra's thesis that micros represent a 25-year step backwards.

As the capital expenditure on hardware drops, it is enticing for non-DP managers to get their own system to give them more apparent control over their own information processing than if it was part of the DP department's many-tentacled grasp.

DP people know, however, that hardware costs are the least significant element these days, and a lot of money could be spent in re-experiencing the painful software birth pains of the modern computer industry.

The only way for the DP department to fight off the dual pressures from users and technological developments that distribute computer power outside the DP ghetto, is to get out and explain and sell DP services to users.

The communication skills needed to bridge the gulf between user and DP

department are essentially the same as the communications skills needed in any other selling or public relations operation.

Unfortunately such marketing attributes are not always seen as an intrinsic part of the make-up of the good DP manager.

This week Computer Weekly is starting a series by a specialist in the art and science of human communications, Nigel Laurie (page 19). At the end of the series, Laurie will be conducting a workshop at which these techniques can be discussed and developed in more depth (see below).

At the same time, a survey of DP managers will aim to establish the current state of communications between the DP department and users, pinpointing useful techniques and areas of neglect.

FOCUS

... on the need for more data earth exhibits in 1980s

THAT much heralded Datafair Technology Corridor proved to be remarkably short, the technology exposed being limited to a half dozen ill-assorted participants, some having only a tenuous connection with mainstream computing.

In fact the basis of selection for the Corridor could well have presented a fascinating discussion topic, replacing perhaps some of the more abstract lectures presented during the assembly.

It was not purely the delegates or visitors who were puzzled by the seemingly random representation of future technology. Those taking part seemed equally baffled. It was a widely held belief of those present that the Electronic Music Studios had not got their venue (or dates) wrong. Just what relevance an electronic speech synthesiser system has for the DP industry is hard to fathom. Maybe it is felt that the DPM should modulate his voice following the discovery that the whole of the previous day's output has been lost — presumably shredded. Or the disc involved in the head crash has been re-loaded.

Even so, investing in voice control equipment does appear somewhat extravagant. The presenter himself, following an impressive mind-blowing session, seemed at a loss when asked by Focus who would be potential users of such elaborate and expensive gear.

In contrast the Plessey bubble memory device exhibit could well have been of considerable interest. Unfortunately, someone had stuck a pin-in the shape of a power cut — in the collected bubbles and demonstration was limited. Unlike their US competitors, Plessey seem loath to project themselves and their product into the DP market place and research is still proceeding. Meanwhile, such companies as Texas Instruments have no doubt got salesmen floating out, swamping the DP industry with bubbles.

Other exhibitors were hardly in the future technology category. The EMI voice recognition system is hardly new; similarly Quest Automation's Datapad system already has a healthy list of customers.

Not all DP professionals would agree with Dr Chris Evans who, in the recently published paperback "Science Fact", suggests that man is

about to create a new companion for himself on his native planet, Robots. This Evans assumes, will revolutionise life in the 1980s.

In fact, of course, scientific timetables are just about as reliable as the average programming project forecast. Both are hopelessly optimistic at the time of writing. And both can be guaranteed to make less than anticipated impact on fruition.

Given the choice, most DPs would plump for an early third generation working environment, with its well-laboured problems and hazards. They would voice agreement (modulated or otherwise) that a more practical Datafair would include:

● A display of guaranteed software debugging kits;

● A line printer which gives a four minute warning before running out of paper and does not emulate the Concorde on take-off;

● Tape drives with finger-proof shutter.

However, the Datafair stands did provide one highly significant factor: that the basic requirement of DP life is not advanced technology, sophisticated software or intelligent co-operation between man and machine.

The overwhelming necessity is for prime power. At the show, power cutting was rampant. Signal strength fluctuated in line with the air-conditioning. Typically, IBM had brought its own outside generator. For the rest, it was all too often "corridors of low power".

The rewards for the DP department as a result of improved communications with users will be invaluable in increasing the perceived value of the DP department.

This will give the DP manager more status and more power when it comes to putting the case for the DP department to be seen as the focal point for any organisation's total information service.

It will enable the DP manager to argue more effectively that pockets of mini/micro centres should not be allowed to develop outside the overall control of the DP specialists.

And it will, at last, bring down the barriers between users and DP people, which will improve the status and career opportunities of DP staff and also help to ensure the effectiveness of DP systems.

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ago...- COMPUTER WEEKLY
OCTOBER 19, 1967.

THE 1966A, "a giant computer with more than twice the power of Atlas," was announced by ICL, the company's first venture into the use of integrated circuits. . . . The largest communications network which STC had ever sold, and which included both the first generation principles of Strand and the 6300 ADX system, was officially opened in London for the Royal Navy. . . . A £1 million project which it was predicted, could give Britain the lead in the computerised process control field was planned jointly by AEI, the Steel Company of Wales and the Ministry of Technology. . . . A scanning technique for the production by numerical control of parts that could not be reduced to a mathematical specification was demonstrated by Siemens. . . . Japan's Meteorological Agency ordered an Automatic Data Editing and Switching System, ADERS, consisting of two Data-20 control computers and a Tach 5400. Weather information was to be collected and stored on an international service with Washington and Melbourne.



Larger clerk makes good. . . Ronald Smith, 23, left school at 16 and became a clerk. He has just become the thousandth student to come through a course run by Control Data Institute as part of the government's Training Opportunities Scheme and find a job. He is now a sales programmer at George Wimpey at Hammersmith, West London.

Training project
backed by EEG

COMPUTER managers and training officers are getting together in December at a workshop funded by the EEG and aimed at improving the training of computer staff.

The workshop is part of the second phase of a study into training started by the EEG three years ago (CW, October 10, 1974). That phase, funded to the extent of £1,000, showed up a lack of communication between computer managers and their companies' training officers.

This latest phase, with £15,200 worth of backing, will bring the two groups of people together to get an understanding of each other's work.

The workshop will give each pair of training officers and computer managers a model of a company with training problems. They will analyse the company's needs and produce a course for staff.

One of the major aims of the project is to produce a standard, ideal training programme for general release.

The workshop will be held in Munich on December 7-9. Like the first phase of the project, it is being organised by the Institute of Personnel Management and the National Coal Board's subsidiary Computer Power. The working language will be English. The cost is £80, which includes accommodation.

Further details can be had from Malcolm Campbell, Institute of Personnel Management, Central House, Upper Woburn Place, London WC1H 0HX. Tel: 01-387 2844.

Called the 1500, the new system can have two floppy disc drives with a total of 500,000 characters of storage, 32K bytes of random access memory and a display terminal which includes five programmable function keys.

The 1500 can communicate with IBM mainframes under 3700 protocols, and interfaces for other mainframes are under development.

Software includes Dataform and Databus, high level languages for data entry, validation, editing and for limited data processing. All software is upward compatible.

Datapoint's UK distributor, Venek, said that with prices ranging from £4,800 to £8,000 the 1500 was one of the most competitive systems of its kind.

A NEW range of automatic test systems utilising a microcomputer controller has been introduced by Membrain. Based on an Intel 8080, the controller is common to all four members of the MB7700 range.

The controller consists of the microcomputer, which has a 200 second cycle time display

Nixdorf plans 50 Mbyte
mass storage cassette

A NEW mass storage system for the business computer market is under development by Nixdorf Computers in Paderborn.

Like the IBM 3850, the Nixdorf device will store 50 Megabytes on such cassette, but there the similarity ends (CW, October 24, 1974).

The IBM cassettes are four inch long capsules, whereas Nixdorf is working on cassettes similar to those used for videotape. Nixdorf also plans to offer single 50 Megabyte cassettes as a cheaper alternative to a second disc drive.

The single cassette version is likely to appear next year, and the multiple version will follow once the stacker mechanism for loading the cassettes has been developed. Nixdorf envisages stackers capable of loading

anything from 10 to 100 cassettes.

Nixdorf is also working on an extended controller for disc and tape subsystems based on the Zilog Z-80 microprocessor for use with its 8870 line of business computers. It will be possible to initiate loading of a complete 50 Megabyte cassette into the disc either from the CPU or from the extended controller.

A key benefit of the extended controller is that it will enable the user to change the type of disc he uses without altering his

application software.

The company is putting a major development effort into the 8870/1 business system, which runs under an operating system developed in Canada and originally used the DCC 116 minicomputer also used in the Nixdorf-Entrex key-to-disc systems. The DCC 116 mini was designed to run Data General Nova 1200 software and was the subject of a lawsuit before Data General acquired DCC.

Nixdorf is now developing a new processor for the 8870/1

which will again use the Data General instruction set but will be architecturally completely different; the company therefore does not expect any lawsuits from Data General.

Memory on the new processor will extend to 128K 18-bit words, and it will be possible for two CPUs to share all main memory and peripherals. At present the 8870/1 supports up to four workstations, but that is to be extended to 16.

Nixdorf is also using a software generator, Chico, Checklist input-customer oriented output, to customise applications in its Comet business package more cost-effectively.

The customer can either answer the questions which define his requirements via a VDU on the 8870/1, or by responding to a printed questionnaire.

The concept of the applications software generator was explained in some detail by Bill McKeehan at the Newcastle seminar on the teaching of computer science (CW, September 15).

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Why Heinz is backing Britain

A rosy future for the UK is predicted by Heinz Nixdorf, founder and head of Nixdorf Computer of Germany. "I am buying long-dated British Government stock (gilts-edged securities), and I believe the UK has one of the brightest futures in Europe," he said.

Speaking at the company's Paderborn headquarters last week, Herr Nixdorf went on to question the extent of the damage done by strikes in the UK.

"How many days a year are lost in Germany through Roman Catholic holidays?" he asked. "They cost us far more in lost working time than strikes cost Britain."

Nixdorf said that he had not been born in Paderborn, he would be investing in the UK right now. Nevertheless, plans to build a plant in Ireland have stalled over building costs. Nixdorf has a big new plant in Paderborn and is not prepared to pay a premium of more than 10 per cent for a similar plant in Ireland. The best quote he has had so far is 60 per cent more than the £150 a square metre he paid in Paderborn.

WITH the prospect of an ICL-supported compiler on the 2900 for the structured language Pascal, interest in the language among ICL users is bound to grow. A group formed earlier this year for exchange of information and software among ICL Pascal users is anxious to harness this interest.

The Pascal Clearing House for ICL Machines is organised by David Joslin, of the University of

Sussex. It aims to act as a conventional "user group" for the 1900 and 2900 compilers, meeting to discuss developments, and circulating reports on enhancements and bugs, as well as avoiding duplication of effort in development of Pascal software.

An extension of the group's activity which has just begun is negotiation with the Numerical Algorithms Group, which already produces a large library of

scientific routines in Algol 60, Algol 68 and Fortran, with a view to translating the library into Pascal. This effort is being co-ordinated by David Barron of Southampton University.

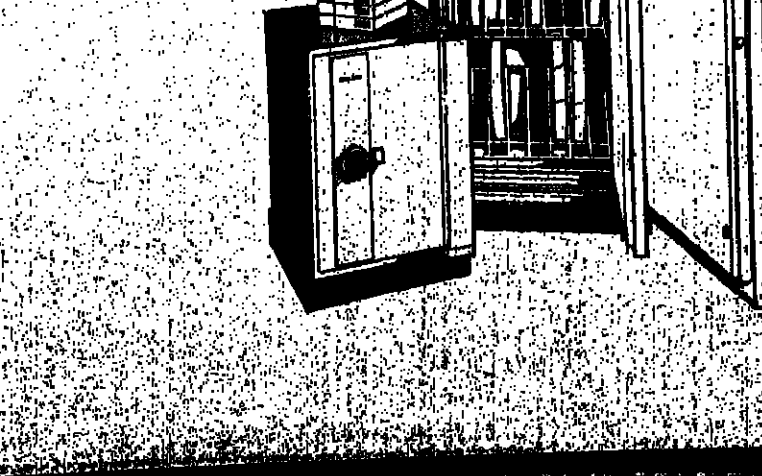
The 2900 Pascal compiler is being developed for ICL by a consortium of universities, and should emerge by the middle of next year. The 1900 compiler was developed by Queen's University, Belfast.

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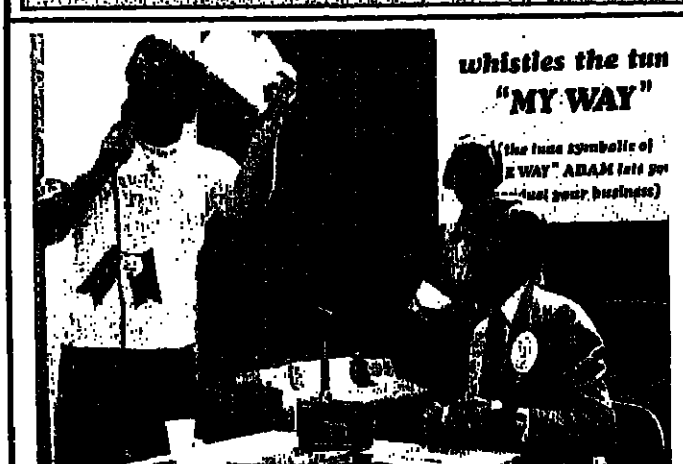
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DOWNTIME

by Chad



whistles the tune "MY WAY"

The star human of the whistling show, grand champion Harvey Pollock, is introduced by Kip Tilt of Logical Machine Corp.

Rib-tickling...

IN Carson City, Nevada, October 1 will not be quickly forgotten. On that day 82 people from the world's greatest nation blew off at the start of the first International Whistle-Off.

The Whistle-Off, previewed exclusively in Computer Weekly (Downtime, September 29), was organised by Logical Machine Corp as a publicity idea for Adam, the office computer which you program in natural language. The Whistle-Off was the idea of a firm called Gordon Bennett and Associates. Gordon Bennett!

The contestants included a coachload of people who

accompanied one Sally Cohn with washboards, spoons and thimbles; Jake Pultrum, who, with the help of his fingers, whistled The Battle Hymn of the Republic; and the Adam computer itself, which did My Way its way.

The overall Grand Champion was Harvey Pollock, a barrister from Winnipeg, whose repertoire was based mainly on the works of Mozart.

The real winner, however, was Logical Machine Corp. For highlights of the Whistle-Off were shown on television across the US, radio stations played Adam's effort and many newspapers covered the event.

Magnetic future

OUR recent Delphic poll on future technology (CW, September 29), has aroused a great deal of interest and Dr Christopher Evans and his helpers are now analysing the hundreds of replies.

A mini-poll, based on our questionnaire, was held last week at Stanmore Junior College, north London, during an evening meeting on mathematics and computers, which included a talk by my editor on Can Computers Save Britain — and Who Cares?

An interesting conclusion of the mini-poll was that a ma-

jority of the 20 or so sixth formers and maths teachers questioned believed there would never be an anti-Luddite computer movement.

The results of the Stanmore poll were brought into question, however, when it was discovered that, due to some confusion, one of the questions asked, "When would magnetic media be replaced by solid state devices?" Although neither the interviewers nor interviewees understood the question, 15 people had a shot at it and eight of them said it would happen after 1986!

Some weeks ago, in his Mythology column, Tom Gilb attacked what he considered to be overstated benefits of database techniques. In his general criticism he referred to the threat of the increasing use of minis for databases — machines which he considers inadequate for such tasks.

Exploding the anti-mini myth

IT is well known, and has been accepted from Biblical times, that you cannot be a prophet in your own country. It is therefore not surprising to find Tom Gilb slaying dragons of IMS, Codasyl and databases on minis in an environment separated from his homeland (Norway) by the North Sea (CW, September 8).

One of the reasons why he has yet to find a successful database user, be it IMS or a Codasyl type database, is that he has a gift for either not meeting them, or when he meets them of carefully forgetting the conversation afterwards.

At a packed meeting of the Norwegian Computing Society last year I opposed him on several accounts, and I would now like to describe why.

My own experience is limited mainly to that of implementing a Norwegian Codasyl database system on a Norwegian mini-computer. However, I would like to show how that refutes Tom Gilb's arguments.

Database manipulation languages are not obsolescent, as Gilb claims, mainly because they (I am thinking of Codasyl) still represent the cheapest way to do it, and there is nothing to replace them anyway.

The next step is relational databases, when their use can be explained in three (or maybe four) letter words and the hardware has arrived. I don't think it takes long to set and record types in a Bachman to an intelligent person who knows nothing about compu-

terers! And that's what he needs to be able to express his problems in acceptable terms.

Database languages do not encourage the use of complex file structures. A given database system will give a choice of possible storage structures and access mechanisms. A database will be a model of some part of an organisation for which one wishes to record and handle data and produce useful information from it.

A successful application of a DBMS occurs when one has arrived at an adequate model which reflects both data and its usage and which can be relatively easily converted to a physical database using the facilities of the chosen DBMS. Total failure and non-cost effective database applications can more often than not be traced to insufficient understanding of the problem; or trying to start too big too soon.

GO TO statements and virtual memory have been much maligned because of their misuse. Anybody can misuse anything including database management systems.

We at Norsk Data have been implementing online databases on minicomputers since January 1975. We now have some 30 installations running from five to six terminals, a 128K byte machine, 10 Megabyte disc up to a multi-machine distributed database system with four machines, 1.5 Megabyte core, 200 Megabyte disc, plus 60 terminals on a data network.

How then can Gilb claim that database systems are too lavish for minis?

If a customer knows what he wants he can be in production with his DBMS online within from one to three months after getting his hardware. If he isn't running a test database inside

Now the challenge has been taken up by Jeremy Slater of Norsk Data, the only computer manufacturer in Norway, Gilb's homeland. Slater makes the case for online database systems using minis, and outlines some of the facilities such configurations can provide.

three to four weeks then something's wrong.

Of course mistakes can be made. We had one case when membership in a manually maintained set was used as a status indicator. There were 50-60 set members per set, and it had been implemented as a single chained set. One consequence of that is that we now vet all database designs, thereby taking upon ourselves the responsibility for any "heavy" databases.

I have spent a year teaching people to use our DBMS online, using one-week courses. Most students can program and they are normally online against a predefined database using a simple query language at the end of the first day. It takes about two days to learn the DML.

If you can get an order entry system using a DBMS up and running with multi-user concurrent access, logging / recovery / privacy / online in four weeks from scratch, how would you justify not using it? If you belong to an organisation which moves with the times, how is changing your database every other month going to go without the reorganisation facility supplied as part of the DBMS you don't use?

I agree with Gilb that minis are a threat, but it is certainly not a threat to the user, it is a threat to the continued use of mainframes for database applications. The quality of software of all types on minis is now not particularly different from that on mainframes.

On minis you can: Run time sharing, batch, remote batch and real time, simultaneously; use Fortran, Cobol, Basic, Simula, BCPL, Coral 66, Algol, PL/I, etc; have a few thousand M-bytes of online disc

storage; machine-machine protocols as standard; and online DBMS.

It is in fact nonsense to say that they are "unsuitable due to the lavish overhead costs". Our DBMS, called Sibas, includes facilities for Codasyl; multi-user concurrent access; a maximum database size of 3.6 x 10 bytes; complete privacy functions; complete backup/recovery roll-back before/after image logging; an average 20-30 DML calls executed per second; and distributed databases standard software.

It is better to have your database on a mini because on-line it is always cheaper; it is physically portable — and it is good fun to go distributed!

Finally, our first customer for a database decided to go that way because they wanted to distribute the availability of information around their concern, and have it online.

In 1975 they jumped in, moving from a Cobol/IBM batch environment, to a mini/Fortran online service with five or six terminals, 128K byte and 10 Megabyte disc.

They now have two databases, each on its own mini, coupled via software with 24 terminals. Any or both databases can be accessed simultaneously from any terminal. They have decreased costs (totally), but increasing production, and they are now buying a third machine

The author
Jeremy Slater has degrees in physics from both Oxford and London. He has been in the computer business since 1970 and has been involved in the design of systems software for minicomputers, databases, file systems, operating systems and programs for handling video output.



Roy Atkinson

Following in the footsteps of Hedsor . . .

AN imaginative programme ranging from discussions of the social and political impact of computers to computer cartoons has been organised by the British chapter of the ACM for its 1977/78 programme.

Three of the sessions will follow up the themes of the Hedsor Park weekend conference earlier this year, entitled "Can computers save Britain?" (CW, July 14). The conference was organised by Computer Weekly and the ACM, which is the US equivalent of the BCS.

Dr Christopher Evans, psychologist and computer scientist, will start the programme

next Tuesday (October 25) and will look at the psychological and social impact of computers.

On January 17 next year Barrie Sherman, research director of the white collar union ASTMS, is to discuss the effects of technological change, particularly on the working environment. And on April 11, a panel discussion of government policy for computer technology will include Conservative MP Ian Lloyd and Reay Atkinson, director of the Central Computing Agency.

The other sessions outside the themes of the Hedsor conference start with Logica chairman

Philip Hughes discussing industry changes over the last year on November 29.

On February 28, Colin Emmott of the Royal College of Art will discuss computer cartoons, including film demonstrations, while on May 23 Royer Pye of Communications Study and Planning Ltd, will look at mass communications.

All meetings will take place at the Polytechnic of Central London, 115 New Cavendish Street, London, WC1, and start at 7.15 pm. Wine and refreshments will be served from 6.30 pm.



Ian Lloyd, MP

Expanding BIS on the takeover trail

THE BIS group of companies is seeking to expand its activities through the takeover of other companies or by giving financial backing to groups of individuals wishing to start their own operations.

During this year, BIS has approached over 20 companies with a view to a possible takeover but none of these discussions have led to any positive outcome.

If the circumstances are right, BIS would be interested in taking a minority stake in a company during an "engagement" period, after which either the BIS holding could be increased — or the company could decide to sell back its share.

For the financial year ended February 1977, the BIS group had a turnover of £2.7 million with a pre-tax profit of £350,000. According to chairman of the group, Roger Graham, they are currently on target for a turnover of over £3.6 million.

Graham believes that to maintain this growth rate, the group will need to extend its operation and it is likely to acquire a minority interest soon in a company outside the computer industry, but which uses computers as an integral part of its operations.

Within the computer business, Graham told Computer Weekly that the group has defined a number of specialist areas in which it is interested, including systems houses, service bureau, word processing and point-of-sale distribution applications.

Graham typified the types of operations which he believed could meld into the BIS group as "companies or groups of individuals wishing to maintain

autonomy over their own activities but realising the benefits that can be obtained by associating with a group, such as BIS, which has substantial resources."

In the UK, the BIS group has three companies involved primarily in DP — BIS Applied Systems, which specialises in database management

in Australia, South Africa, America, Sweden, Teheran, Singapore and Hong Kong.

David Tebb, director of BIS Applied Systems, is now touring Australia, South Africa and Hong Kong, giving courses on database and real time system design. He will also be a speaker at the annual Australian Computer Society Conference later this month.



Roger Graham . . . need to diversify outside the computer industry.

techniques and a wide range of training and consultancy activities; BIS Software, which provides custom built software and systems such as the Midas banking and insurance series; and BIS Deltak, which provides self-instruction systems for in-house training.

BIS Software was formed when BIS took over software house Kingsley-Smith and Associates two years ago (CW, November 13, 1975).

The group also has operations

Users can have a say

Computers can still have a say on the Carter Committee's report on the Post Office, as copies of the survey being carried out by the Data Processing Management Association and Langton Information Systems are still available.

But hurry, as the questionnaires must be returned in the next 10 days. Results will be published in December.

The address of the DPMA at 27a York Road, Maldenhead, Berkshire. Tel: 0628 29978.

ICL gains firsts in Denmark and USSR

TWO firsts have been notched up by ICL. One is an order from the USSR for a 2803 and the second is a move into the Danish market with the 2860 ordered by a manufacturer of cable, wire and nails, Nordiske Kabel-og Traafabriker.

The 2803 is going to the Academy of Medical Sciences in Moscow, which co-ordinates research projects in the 50 medical research institutes around the country.

The academy will run the IDMS database management system to keep track of the projects and will also collect

public health statistics for the World Health Organisation.

The 2803 is the academy's first computer. The £200,000 machine will have 24K of memory, two 60 Megabyte disc drives, a 7502 terminal, two direct data entry stations and two display terminals.

The 2860 in Denmark will replace a 1903A and enable Nordiske Kabel to expand its communications network, which serves a wide variety of users within the company throughout Denmark. The 2860 will serve eight 7502s, 41 terminals and support IDMS.

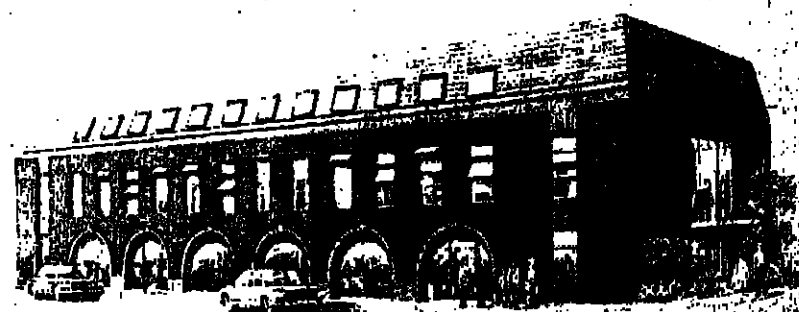
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GILB'S MYTHODOLOGY

Database diagnosis programs



AS a matter of routine system design for about the last seven years, I have made it a practice to specify a "database diagnosis program" in any system which includes a complex central file or database. I do it as naturally as I have put on my car safety belt since 1960.

I know that not everybody shares my interest in seat belts, but I don't push the point since, in the long term, optional seat belts will result in an increased group of reliability-oriented system designers.

I have been surprised, as the years speed past, and the literature on databases increases explosively, to find virtually nothing on the use of database diagnosis programs in this literature. This inevitably results in most database systems being planned without such a facility. In the long term a set of analysis programs will be developed to solve some obvious operational problems such as mysterious breakdowns in the database. But unfortunately these will often be created for one-time use and discarded shortly thereafter.

A database diagnosis program should, in fact, be a focal point of continued development of our ability automatically to analyse one of our most critical resources, the centralised database. It should probably be developed over a period of years as experience dictates. This means that it must allow the user a wide variety of parameter options as to what shall be analysed and how deeply it shall be analysed.

Data Base Diagnosis (DBD) programs can quickly become very machine-resource demanding, if not limited in some way.

A DBD program can be far more effective if it is considered early in the design of the project. One reason for this is that the fundamental redundancy within records and fields which is a prerequisite for detection of certain classes of errors, can be designed into the records and fields from the beginning. Another reason is that the benefits of DBD can be enjoyed throughout the entire project development cycle.

It is an anachronism to think that the application programs provide the necessary tests on records and input data, to guarantee the quality of the database. A true database implies many independent programs which only see part of the data picture BUT WHICH ARE CAPABLE OF DESTROYING ALL OF IT OR ANY ONE PART OF IT.

Only a DBD program, like the Data Base Administrator concept, can keep quality control over it all. A database diagnosis program can include every conceivable validity test, applied elsewhere to all fields and records. There is no reason to be afraid of repeating checks (use the same subroutine). It gives protection against failure of one set of checks, and has the added advantage that the DBD program checks can be used as a test of the program.

A DBD program is an excellent automatic program testing aid during initial program development. It tests that all the programs are co-ordinated to the common agreements on records and data elements. It should be a required part of the program development cycle.

Auditors should insist on and require their own private

DBD program, as well as the possession and use of one for the programmers. DBD program amounts to automatic auditing and is the only practical way of thoroughly checking a large database.

A complete DBD program which tests all indexes, chains, records, fields, inter-field relationships, inter-record relationships and even relationships between the database and other existing files, is really, if you think about it, an automatically readable description of the database. Instead of all the incredible energy which I see presently being devoted to making and maintaining humanly readable database documentation, we should redirect it to putting the same specifications in programmed form. The obvious result is the saving of human effort to read record printouts and to read DB documentation with a view to assuring the correctness of one or both.

One bank which listened to this advice, and applied it to an eight year old "no problems" database in an online system, got a list of 300,000 errors in about a million accounts. The money amounts were all right but the statistical classifications of customers, from which marketing and top management got their reports, was very wrong. Really?

Several months overtime at the branches to clean it up and a 20-minute DBD program run each morning to keep it clean - by top management order.

For more information see my book "Data Engineering (Student Literature)".

SOFTWARE FILE

Index generation package in UK

THE role of word processing software in the office of the future has been increasingly recognised, but a kindred subject - index generation - is seldom approached by the developers of commercial word processing equipment. The Austrian developer of an index generation package is seeking to fill this gap in the UK market, by negotiating an agency in this country.

Index generation for character-string data is usually applied to academic areas like literary and linguistic analysis. Ivo Steinacker, the developer of the present package, intends that it should be applied to more "down-to-earth" areas like office correspondence.

"If a businessman knows that he sent a letter to so-and-so about roller bearings, but can't remember the date, he queries

the index under the name of the company and "roller bearings", and it will pull out all letters referring to both."

The index is generated in batch mode from "any machine-readable text", such as a tape of correspondence built up from day to day by a word processing system. Obviously, in such a case, periodic re-runs will be needed, to generate the index for the updated tape.

The index generation software will search for phrases as well as single words in the text. To determine initially the correct depth of indexing, a user would normally wish to run the package several times with different parameter values, said Steinacker.

The software will run on the IBM System 32, or any other machine with an RPG compiler, he said. He is also willing to rewrite the package in another language if there is a demand for it.

There are already two prestigious users of the system - the German Standards Institute and the International Telecommunications Union, in Geneva. A test run has also been made by the European Space Agency.

Revised US version for Hoskyns system

A RANGE of manufacturing software, originally designed in the UK by Hoskyns, has emerged from the US in a radically new version, aimed at accommodating the growing use of database. Further versions, directed at the expanding mini-computer market, will be Hoskyns' responsibility.

The Hoskyns suite was originally known as Standard Systems, but, for US consumption, was renamed Modular Applications System. In the US, it is handled by Martin Marietta Data Systems, of Baltimore, which subsequently took control of Hoskyns (CW, April 13, 1975).

MAS II and related new versions have been placed under the general heading of MAS-80. The major innovation with MAS II is that the modules, instead of using several conventional files, are centred around a single database.

MMDS has developed modules to manage the leading database management systems and present the user with a consistent interface. MAS II is accessed in transaction mode, and includes its own small TP monitor, while MAS I worked in batch.

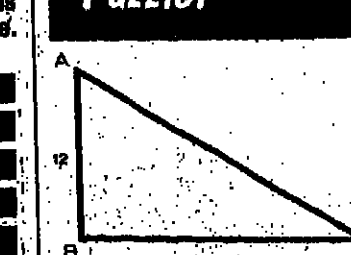
The policy is to direct MAS development effort to the countries where appropriate expertise exists, explained Neville Cerfontyne, who is in charge of developments outside the US.

Cerfontyne said that the first approaches would obviously be to the market leaders such as Digital Equipment, Data General and possibly the IBM Series 1.

Experienced users

A MISPLACING of one or two letters can often create entirely the opposite impression to that intended. It is doubtful that any reader of the item on the Display users' conference (CW, October 6) seriously thought that local users would be talking about "the 'inexperience with the system.' The intended phrase was, of course, 'their experience.'"

Puzzler



WHEN this type of information is available, about any right-angled triangle, there is an ancient formula which gives the length of the hypotenuse in only a few seconds. Can you work out what it is before turning to page

10. The first mini implementations should emerge by March 1978; and future plans include implementations for mini-mainframe distributed systems, as well as stand-alone minis.

The database-oriented MAS II is already available in the US and should begin to be marketed in the UK at the end of this year.

MAS is built of six suites, handling production control, inventory management, order processing, cost control, business planning and financial management.

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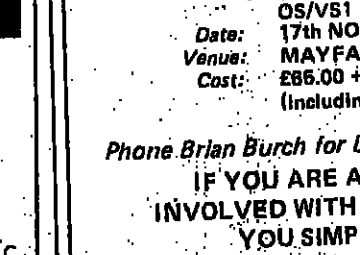
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Experienced users

A MISPLACING of one or two letters can often create entirely the opposite impression to that intended. It is doubtful that any reader of the item on the Display users' conference (CW, October 6) seriously thought that local users would be talking about "the 'inexperience with the system.' The intended phrase was, of course, 'their experience.'"

Puzzler



WHEN this type of information is available, about any right-angled triangle, there is an ancient formula which gives the length of the hypotenuse in only a few seconds. Can you work out what it is before turning to page

10. The first mini implementations should emerge by March 1978; and future plans include implementations for mini-mainframe distributed systems, as well as stand-alone minis.

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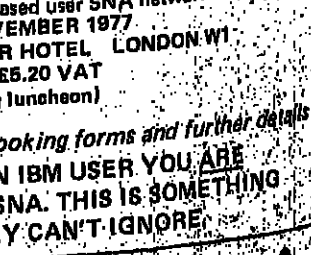
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EDITED BY STEPHEN BELL

Filing fiche with Data Boss

A NOVEL application for a database management system has been found by Florida Computer, of Miami. The company has successfully marketed its database management system Data Boss (CW, September 30, 1976), to installations in the US with very large microfiche libraries. UK agent Turnkey Software, of Chalfont, Bucks, is now approaching the same market in Europe.

Users with large microfiche libraries have much the same requirements as those with large computerised databases, notably a need to access the same microfiche by several different keys. The Indexed Data Boss system is well-suited to this kind of retrieval.

The simplest approach is to retrieve from the database a reference number which will tell the user where to look for the appropriate fiche or film on a separate physical storage medium.

The terminal can, however, be linked direct to some kinds of microfiche reader, so that retrieval is completely automatic. Data Boss runs on Digital Equipment PDP-11s, under the RSTS-E operating system.

US users of the Data Boss microfiche system include the US Air Force Base, Utah. The file managed by the system there will eventually have a size of 2,500,000 records.

UK price for the basic system is £8,000. This supports a database of up to 32 Mbytes. There are further charges for more capacity and multi-level indexing, but the terminal-reader interface is included free.

Interdata enhances OS/32 MT system

WITH an enhanced version of the OS/32 MT operating system, Interdata has introduced dynamic memory management techniques on its 32-bit minicomputers. At the same time, the company has released an operating system adjunct approaching the growing on-line programmer market.

The dynamic version of OS/32 MT2 supports up to 255 concurrent user tasks. The previous version of the operating system had the same theoretical limit, said UK director Gordon Ambidge, but in order to exploit it practically the tasks had to be very small. With dynamic memory management, 255 concurrent tasks became a practical reality, he claimed.

Dynamic memory management examines the actual memory requirements of tasks at regular intervals and adjusts the size of the partitions appropriately, rather than setting up fixed partition sizes in advance.

Such "heuristic" approaches to producing increased throughput have been employed by other mini manufacturers, such as Data General with its Advanced Operating System (CW, November 25, 1976). AOS manages the problem by adjusting priorities rather than memory partitions.

Online programmers are accommodated through the separate Multi-terminal Monitor. MTM supports up to 16 concurrent terminal users and 16 background batch tasks.

Software to maintain private user file directories is included.

Scheduled warnings from the Stars

THE range of software products designed by Value Computing, of Philadelphia, to assist the operation of a DP installation, has been extended with another scheduling aid. Like Value's earlier products, it will be marketed in the UK by RTZ Value, a division of RTZ Computer Services (CW, March 31).

The latest product, Stars (Status Revision System), allows the actual progress of tasks to be monitored against the schedule previously generated by Value's Scheduler. Monitoring of tasks in the processor itself is automatic,

using data from IBM's System Monitoring Facility. Outside the machine, progress of tasks such as data preparation are notified manually, through terminals.

Stars will warn the user when actual performance is falling behind schedule, so that the schedule can be reorganised, if desired. If a job goes wrong, the user can be informed of any other jobs which depend on it and, in consequence, cannot be processed.

A number of large users in the UK are already interested in the package, said an RTZ spokesman. A UK price has not yet been established.

Hoskyns ties up another FM deal

ANOTHER facilities management contract has been gained by Hoskyns. The company has taken over the ICL 2803 and seven data processing staff at Customagic, of Manchester, maker of furniture coverings.

Customagic's site to Hoskyns Manchester Systems Centre. This will enable Customagic to continue using the machine, while saving office space. The company also expects to make a 30 per cent saving on its DP budget. The deal is valued at about £100,000.

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The LIBRARIAN/Online Extended, an advanced version of LIB/OL, is fully compatible with LIB/OL and provides a bridge between the LIBRARIAN/TSO and LIB/OL.

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PROGRAMMER NOTES Documentation—need to be all things to all men

DOCUMENTATION is one of the most widely criticised aspects of programs - both the documentation intended for the guidance of a non-computer-oriented end-user, and that which will only meet the eyes of fellow programmers.

In its widest sense, documentation includes everything from end-user and operator instructions to the lines in the coding. A critical, seldom asked question is whether the programmer should be expected to write material aimed at these various audiences equally competently.

Installations, conscious of the criticism of increasingly rigid standards, tend to the programmer this often means reams of narrative and diagrammatic documentation. Many programmers find this to be the job for which they were trained. The inescapable result is how do the readers of this column handle the problem of documentation for all these

different purposes? Are you called upon to be a technical writer as well as a programmer? Do you consider yourself adequate to the task, or do you think DP departments could benefit from employing a specialist technical writer?

Programmers are in a good position to judge maintenance documentation, since they are both its producers and its consumers. Is too much or too little documentation required by "installation standards"? What kind of documentation do you find most helpful and what do you think is unnecessary?

Documentation is also the interface between user definitions of the problem and the formulation of the program to handle it. As such, it is the weak link in the program development process. Can anything be done to strengthen it - for example, a formalised "design language"? If so, of what kind?

What form of documentation do you like to receive from the designer of the problem, whether user or systems analyst?

Contact
Stuart Moore

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by Don

PEOPLE


End of Summer

The Summer Computer League season ended last week with the champion, Jodup, winning its last game, thus getting 16 points out of 16. SIA lost its last game and so goes down with Computing. Defeat for TSL in Division Two in the last game, and wins by Lambeth and the other two teams, put Division Three winners with Laur Punter.

A beery evening on the Thames gave the champions a chance to celebrate, which Division Two winners Datscane (left) certainly did. Our picture on the right shows the league organiser Danny Boreham (left) and the secretary, Elaine Boreham (right), as trophies they were awarded for all their voluntary hard work.

Alan Starkey has become non-executive chairman of **Jackson Associates** of **Culchester**. He is also chairman and managing director of **Framptons Nurseries Ltd.**

The board of **Jackson's** has also been joined by **Michael Burton**, director of **C. E. Heath (Insurance Broking)** and **Chris Rengert**, senior partner of **Slater, Chapman and Cooke** and formerly auditor of **Jackson's**. Both will be non-executive directors.



Edwards **Francis**

Derek Edwards and Tudor Francis

Group, recently appointed directors of the company, will retain their responsibilities as customer service managers.

Sean Dixon-Child, director of NCR Ltd's financial and government division, has been appointed to the main board of directors.

Frank Zapfe, lately of Spicer and Pegler where he was a consultant, has joined Allied Business Systems as a consultant liaison executive.

OCTOBER 26
Legislation and operations. BCS
Operations Group, Polytechnic of Central
London, London W1, 15.00.
STS (Statistical Tabulation System).
BCS, Study Group for Computers in
Survey Analysis, Polytechnic of North
London, London N1, 15.00.
Our job, computer performance mea-
surement and timing. R. Hanson, D. J. Hall.
BCS, S. Fates branch, Royal Hotel, C.
London, 15.00.
Word processing. K. Baxter, C. Holman.
BCS, Teesside branch, Teesside Polytechnic,
Middlesbrough, 19.00.
Distributed intelligence through the
use of intelligent terminal systems.
Raytheon-Cosar Data Systems, DPMA-
Essex branch, Raytheon Cosar Data
Systems, The Pinnales, Harlow, Essex,
20.00.

OCTOBER 27
Computer graphics and animation. Prof.
A. A. Hopcroft, BCS, M. Willebrandt.
Royal Military College of Science,
Shrivenham, 20.00.

Results and League Tables

Division I																			
FNS 5, Lloyds 0																			
FNS 5, SIA 0																			
Judqu 5, Lloyds 0																			
	P	W	D	L	F	A	Pts			P	W	D	L	F	A	Pts			
Jadqu	R	0	0	0	0	5	11	1b		Inda	R	0	0	0	0	14	1b		
Gryphons	R	0	0	0	0	2	4	12		Scors	R	0	0	0	0	2	2b		
Inda	R	0	0	0	0	2	2	14		Lambeth	R	0	0	0	0	2	2b		
FNS	R	0	0	0	0	2	10	10		Hewens	R	0	0	0	0	4	2b		
Urbach	R	0	0	0	0	3	10	10		Scouthgate	R	0	0	0	0	4	22	2b	
Scouthgate	R	0	0	0	0	3	10	10		Coop/Wally	R	0	0	0	0	1	10	2b	
Urbach	R	0	0	0	0	3	10	10		LSL	R	0	0	0	0	3	14	4	1b
SIA	R	0	0	0	0	1	6	11	47		Inda/Panther	R	0	0	0	0	1	4	21
Coop/Wally	R	0	0	0	0	2	7	10			R	0	0	0	0	0	0	0	40
Division II																			
	P	W	D	L	F	A	Pts				P	W	D	L	F	A	Pts		
Inda	R	0	0	0	0	0	0	0		Atchepu	R	0	0	0	0	0	0	0	
Lambeth	R	0	0	0	0	0	0	0		DA	R	0	0	0	0	0	0	0	
Urbach	R	0	0	0	0	0	0	0		Scors	R	0	0	0	0	0	0	0	
Scouthgate	R	0	0	0	0	0	0	0		Coop/Wally	R	0	0	0	0	0	0	0	
Urbach	R	0	0	0	0	0	0	0		LSL	R	0	0	0	0	0	0	0	
SIA	R	0	0	0	0	0	0	0		Inda/Panther	R	0	0	0	0	0	0	0	
Coop/Wally	R	0	0	0	0	0	0	0			R	0	0	0	0	0	0	0	

Silk Finish Ltd. of Borehamwood, Herts, has made the following appointments: **Frank Airey**, formerly sales manager of the company's Southern division is now director of sales and marketing; **Frank Smith**, previously a representative becomes sales manager, Southern division; **Jim Kidby**, formerly representative, is appointed sales supervisor; and **David Ansell**, previously supplies manager with Imperial Typewriter Company at Leicester, has been appointed as sales administrator Northern division.

Valere de Smet has joined Decision Data as vice-president, international operations. Previously he held marketing management positions with Singer and Vector. De Smet replaces **Georg Herzfeld**, who has resigned as chief executive officer of the European operation to pursue personal interests.

Michael Meredith, former area sales manager with Computel, has joined CTL as a senior consultant.

Graham Page, principal computer assistant in the data processing department of London Transport, has now been appointed as training manager of its mechanical engineering department.

Another appointment at London Transport is that of **Paul Larkin** as principal computer assistant (development). He has been promoted from a senior analyst.

Louis Navin, vice-president and treasurer of Honeywell Inc in

OCTOBER 27-28
Meeting, IBM Computer Users' Association Operations Group, Centre Hotel, Liverpool.

OCTOBER 31
Transferable systems, BCS Medical (London) Group, ICL, Euston Road, London NW1, 17.30.

NOVEMBER 1
Record processing conference and exhibition, Institute of Administrative Management, Scottish branch, City Hall, Glasgow, 8.00.

NOVEMBER 3
Measurement of computer performance, Prof P. A. Shinet, BCS, NW London branch, Railway Hotel, Greenford, Middlesex, 10.00.

NOVEMBER 3
Management Education Seminars - "Project Management, in a structured environment", Data Processing Management Association, Montclair Hotel, London W1, 14.00.

NOVEMBER 3
Is there a future for the DP profession? Colin Goldsmith, BCS, Spink Arms, The Bull Inn, Sudbury, 19.40.

Bankers, automated - BCS
G. D. Robson, A. Partridge, BCS, London branch, Office of Specialisation, 100, The Strand, London WC2R, 19.00.

Future storage devices, BCS
London branch, Windsor Hotel, Bedford Square, 19.00.

NOVEMBER 3-DECEMBER 31
Systemised training, British Institute of Management, 77, Third Avenue, New York, 10017, New York, USA.

NOVEMBER 3
Cybernetics and risk, law, economics, J. H. Gray, Founders, BCS, 100, The Strand, London WC2R, 19.00.

Hardware survey, BCS
London branch, 100, The Strand, London WC2R, 19.00.

Polymorphic, of London, London W1, 14.00.

Computers in engineering, BCS
Oxford branch, 100, The Strand, London WC2R, 19.00.

Slag Road, London W1, 14.00.

NOVEMBER 3-11
Computer '77, software and hardware, 100, The Strand, London WC2R, 19.00.

conferencing, ILLC
Chicago, Illinois.

Coming of the micro systems revolution

There is little doubt that microcomputer systems are about to make major inroads into the OEM minicomputer marketplace, according to a report issued by the First Boston Corporation, a New York company of Investment Bankers. Price erosion in micro components, and the potential outcome of forthcoming litigation between mini and micro manufacturers, are the key elements in this trend, according to the report, and the only major stumbling block will probably be a lack of programmes to meet the demand of new applications.

Although the current crop of microprocessors have failed to take away market share from the minis, due mainly to the fact that they are predominantly slow in operation and only 8-bit,

Annual increase in sales for a PDP 11/45 or 11/70 equivalent microcomputer system once current micro price levels are reached.

The report highlights two separate aspects to the question of software for the new microcomputer systems. First, there is virtually no compatibility between micro software and the wide range of applications programs available for minicomputers. To overcome this, programmers with new skills will be required.

Secondly, the potential outcome of litigation in the future could well open up that wealth of software, and greatly increase the potential market penetration. Again the major problem will be in finding enough programmers to go round the new applications.

point early next year. At that time, both Intel and Zilog are scheduled to join the ranks of 16-bit device manufacturers, and the report's author Ming Y Li, talks of the Zilog management's prediction that its device will have the equivalent computing power of a PDP 11/45 or PDP 11/70.

With a potential CPU cost of \$3 per chip in a few years time, there should soon be considerable migration towards the micro and away from the mini.

pending litigation, and primarily the case drawn up between Data General and Fairchild semiconductor, that holds the fundamental key to the immediate future of the microcomputer. In essence, Data General is suing Fairchild for inappropriate use of trade secrets in the design, manufacture and marketing of its soon to be launched 9440 microprocessor.

The device emulates the operation of the Nova minicomputer, and although it

Some 50,000 microcomputers and systems will be sold this year, estimates, and semiconductor price erosion indicates a potential for a 100%

Intel adds floating point arithmetic library free

ADDITIONS to its software capability and its range of intricate emulators have been made by Intel. The additions cover a new floating point arithmetic library, FPAL, and emulators for the MCS-85 and MCS-48 micro systems.

The FPAL, which will be supplied free to all registered Intellect diskette operating system owners, is intended to reside on a disc as a library routine to be linked into applications software as it is written. It consists of object subroutines that implement the Intel floating point standard for both assembler and high level language programmers.

It provides a 32-bit format add, subtract, multiply and divide, as well as floating point

or integer conversion routines, floating point comparison routines and negation, and absolute value and zero routines, all of which save and restore 8080 registers, and are compatible with PL/M linkage conventions and the new RMX/80 executive.

The two new emulators offer the normal facilities of testing prototype system hardware and software simultaneously. With the MCS-85 emulator, the ICE-85, the module is connected to the prototype via 40-pin adapter plug, leaving the 8085 CPU chip in situ, and operational. For the MCS-48, the ICE-48 connects via the CPU socket in the prototype, replacing the CPU chip, which can be a 8048, 8748, or 8035 device.

Successor to System 80

Successor to the System 80 microcomputer system has been introduced by Trivector Systems incorporating up to three Zilog Z-80 microprocessors, with access to a potential read/write memory of 128K bytes.

Known as the Triton 3, the system can be configured with one, two or three processors, depending on requirements. With three processors, the system can be configured as a master and two slaves, with the master processor having access to the total addressable memory capability.

Interface boards are available for a wide range of peripheral devices, such as displays, printers, teletypes, floppy and hard discs.

The normal software for the system is a multi-terminal based

How PAL differs from IDC Europa

The table below, sent to us by Pedder Associates, underlines the caution with which all market share figures have to be approached.

It is clear from the table, particularly in the case of IBM and ICL, that the two research organisations, IDC Europa and Pedder, have come up with wildly divergent figures, yet it would be wrong to assume that either set was inaccurate.

The reason for the discrepancies becomes clear when one learns that while calculating the value of installed base, IDC heavily marks down the value of old equipment, so that machines like ICL's System 4 or Elliott 803 are regarded as having little residual value.

Pedder on the other hand uses the value of any discontinued system when last marketed, which means that ICL's large installed base of obsolete machines enormously increases the company's market share.

IDC has consistently emphasised that its approach to valuation heavily deflates ICL's share, and adds that it expects the ICL share to increase once the large 2800s are installed in substantial numbers.

Neither method of valuation can be said to be right or wrong: IDC's is particularly sensitive to recent trends and tends to exaggerate the success of a company which has installed a large number of large systems over a short period; Pedder's gives a stronger correlation between the value of a base and the number of customers a company has.

% SHARE BY VALUE OF UK-INSTALLED COMPUTER SYSTEMS AT END 1976

Supplier	Source				
	IDC Europa	PAL Annual Census			
		All systems	Mainframes	Mainframes £100K	Mainframes £500K
Burroughs	6.1	9.0	6.7	7.1	5.8
Honeywell	8.5	6.8	8.2	8.0	6.5
IBM	47.2	25.5	37.1	37.4	42.8
ICL	26.5	28.2	37.7	37.8	34.1
Univac	6.0	3.5	5.2	5.2	6.0
Others	5.7	27.0	5.1	4.5	4.8

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1. *Chlorophyll a* and *Chlorophyll b* content of the leaves was determined by the method of Arar and Johnson (1977).



170-171



University shows how micros can help industry

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September 22) is certainly very wide of the mark when he described NDPCAL as an "orthodox and somewhat insular" organisation.

One of the particular features of NDPCAL is that from the first it broke away from the orthodox CAI "programmed instruction

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Why we're not so insular . . .

One of the particular features of NDPCAL is that from the first it broke away from the orthodox CAJ "programmed instruction

CAI (Computer-aided Instruction) is the orthodoxy, at least in the US, and it is to the great credit of Richard Hooper and his programme committee that the NDPCAL had the vision to be

Speeding council house allocations

One of the problems was that the cities were not over-willing to co-operate with each other.

NEWS IN BRIEF

Tearing down the walls of mystique

The company, Data Systems Electronics, said that small systems such as the Logabax 2010 "cry out for a down to earth across the counter approach to selling."

The firm hopes that its "computer shop" approach will "tear down the walls of mystique, buzzwords and complexities which normally face the first time user."

Ferranti on the move

The new address for the Military Systems Division is Bird Hall Lane, Cheadle Heath, Stockport. Tel: 061-428 0771. Telex: 666803.

2960 for

2960 for trading group

The new machine will support a terminal based network which is being installed at various sites in the UK, and which will be used to extend management planning facilities and to implement some new systems, such as a company-wide management information system. It will use DME.

Prime shared

A PRIME 400 has been bought jointly by Distributed Data Processing and Systematics International, both in Basildon. DDP will use the system to expand its services to scientific and engineering users, while Systematics International will develop an online database of marketing statistics.

A new data preparation and computer supplies company called Excel Data has been formed by MacArthur Cunningham formerly operations manager with Esco Computing. Excel's address is 150 Hand Street, Glasgow, G2 4NA. Tel: 041-3872777.

New bureau in Central London

"There is a definite need for OS machine time in central London," said Royston Ballan. Ballan added that Delta was not specialising in particular application areas but was aiming to provide computer power Delta in Newmarket Street running the 260 under OS by day and DOS at night.

COMPUTER WEEKLY, October 20, 1977

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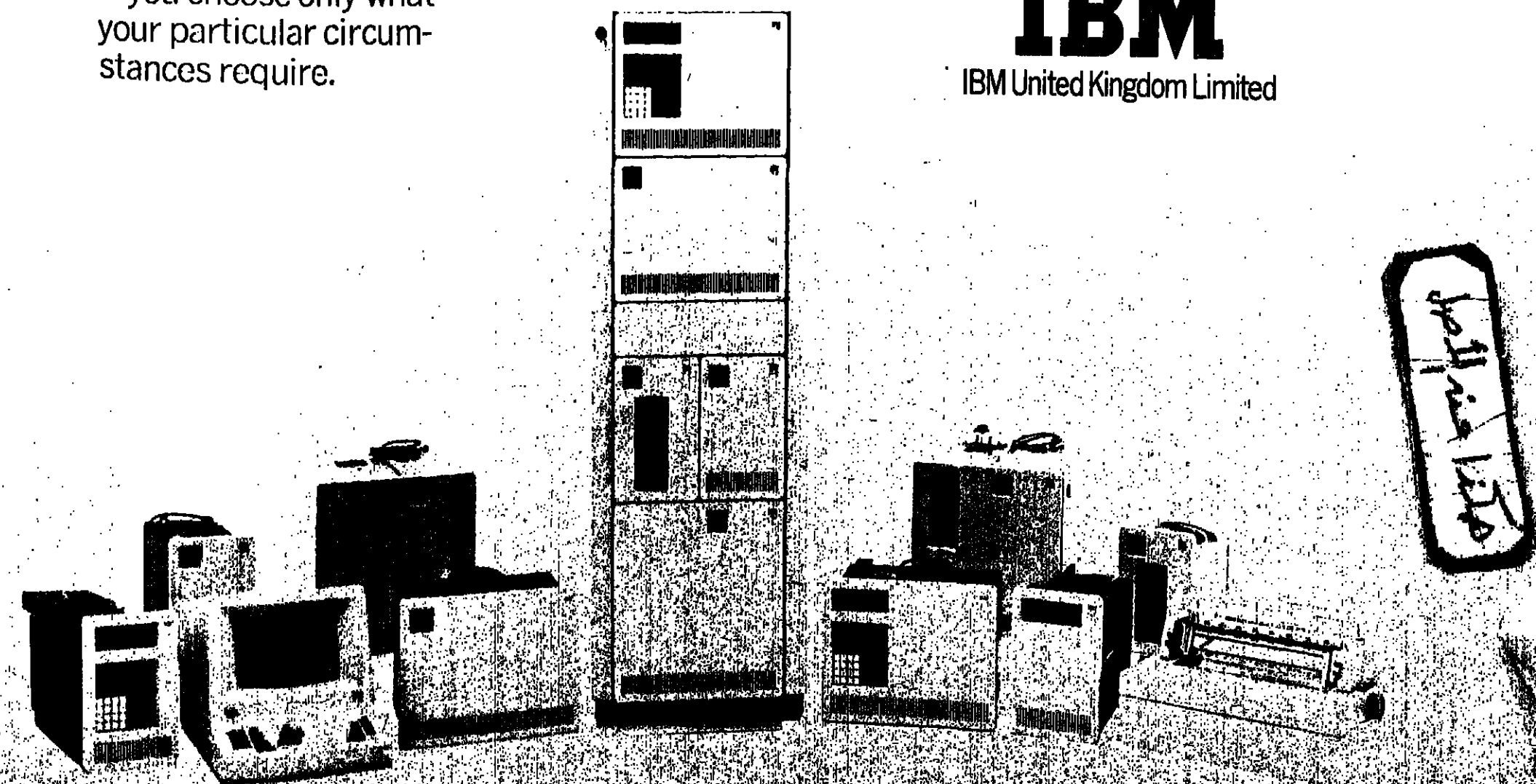
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Argos to install in-store system

AS part of its expansion programme, Argos, the Green Shield stamp company's catalogue showroom chain, is to install computer systems worth over £200,000 at the 20 new showrooms being opened later this year and early 1978.

Each showroom will have a Comet 1608 computer with 24K main memory handling up to eight Comet terminals. These terminals have calculator-like keyboards and both they and the computers are made by Comet Computing Systems of Bedford.

With the new system, sales assistants using the terminals will make stock level and price inquiries.

The stock level of any item is displayed on the terminal together with the price, and the assistant can key in the quantity the customer requires. This order is then printed out in the stockroom instructing any of



Dr. Mike Smith, Argos director of marketing (left), and Rex Ingram of Comet, talk with one of the sales assistants at the Argos catalogue showroom in Oxford.

the storemen to pick up the item and load it on a conveyor belt.

Better management information will then be available to the store management as stock movements can be followed, and one future application could be routine stock re-ordering from the main warehouse by each branch storeman.

By using this system, Argos is hoping to minimise costs by gaining a better picture of its constantly changing merchandise situation.

£750,000 LesterNet order for Burroughs

TO the outside world, all building societies may look similar, yet each one takes a completely autonomous and individualistic view of the best ways to meet the requirements of its customers.

While pioneering societies like the Britannia believe that real time passbook updating at branch counters is the shape of

things to come for the whole movement, others like the Leicester believe that offering a comprehensive savings bank service is less important than providing an efficient savings and loan service as cost effectively as possible.

The Leicester is installing a nationwide network of VDUs, one at each of its branches, but has decided against real time file inquiry and updating on its twin Burroughs B3700 installation at Oadby, Leicestershire.

Instead, each day's transactions will be transmitted throughout the day to the mainframe, but will be checked and batched up on disc for overnight processing; online file inquiries will be answered with the previous day's balances.

"A real time passbook updating system would be much more expensive than we are planning, and real time file updating would also be much more demanding of systems effort," Paul Rylett, computer manager at the Leicester told Computer Weekly. "We simply don't believe that the extra cost is justified at present."

In order to implement the new network, the Leicester has placed a £750,000 order with Burroughs for 170 TD 833 VDUs, three B374 front-end processors, and 192 TA 2401 modems, which

have just been given the UK Post Office approval.

The Society estimates that over a five-year period its modem cost will be 50% of what it would have been if it had rented 2400 bps devices from the Post Office. It is Burroughs' first UK order for the TA 2401.

Two of Burroughs' special software aids are being used to implement the Society's communications system, called LesterNet.

Burroughs' Network Definition Language will be used on the B374s for generating the operational software, and will communicate with the Burroughs Message Control System on the B3700s.

The B3700s are expected to meet the Society's requirements for two to three more years, with the addition of further memory and peripherals, after which there will be a full evaluation of hardware available at that time.

The Leicester Society was formed by an amalgamation of the Leicester Permanent and the Leicester Temperance Building Societies. The Leicester Permanent was the first to install a computer in the early 1960s, and switched to a B3500 in 1971 while the Temperance used the Centre-file bureau, running its files on IBM hardware; they have all now been transferred to the twin B3700 system.

Low cost Scrumpi II

A REVISED version of the low cost microprocessor development system, Scrumpi, has been introduced by Bywood Electronics. Known as Scrumpi II, the system offers several enhancements for the old price tag of £55.

The main differences between Scrumpi I and II are the addition of 512 bytes of PROM and 512 bytes of RAM, edge connectors and wire breaks in the buses for external connections, and the use of the National Semiconductor SC/MP II microprocessor (CW, August 11). One of the edge connectors carries the buses for connection to external systems.

Although still programmed in the same way as Scrumpi I (CW, September 8), using mode and data switches, Bywood is also working on the development of a keyboard and display unit that will act as the I/O device for Scrumpi systems.

Based on the use of a National clock chip, used primarily for its display and driving capabilities, it will offer the potential of a high complexity time control system, capable of triggering up to 160 different command signals in a 24-hour period, which could make it well suited to many industrial applications.

Announcing CA-SORT Release 5.0

Enhancing CA-SORT twice a year gets harder all the time.

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Release 5.0, for example, brings a number of improvements in sort performance, I/O management and flexibility.

There has been a further

reduction in I/O accesses through extension in the command chaining logic.

String extension techniques have been enhanced and the sort has been finely tuned for VS through use of monitor systems.

Full support of 3350 disks (as provided by IBM Release 34) is now available and, under DOS, support for multiple input devices (tape and disk) is now provided.

Finally, DOS users may now profit from optimum work device assignment through automatic resolution of work I/O device conflicts.

IBM users in 28 countries continue to switch to CA-SORT at the rate of about 100 a month. There must be good reasons.

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Shape of devices to come from Zilog

FURTHER information about the eight-bit single-chip microcomputer, and 16-bit "number crunching" micro were given last week by Ralph Ungermann, executive vice-president of Zilog, when he spoke at a seminar at the Larch Foundation, near High Wycombe.

The Z-8, eight-bit device (CW August 4) is now scheduled to appear in quantity in March. Intended primarily for stand-alone applications, particularly where system memory requirements are small, the device has an on-board memory capacity of 2K bytes of ROM and 8K bytes of RAM, together with 32 I/O lines.

Seventy-six bytes of RAM are available as general purpose read/write memory. The 32 I/O lines are formed into four ports, in which reside the remaining 20 bytes of RAM. Of the four ports, two are constructed as full eight-bit units, while one is four-bit in four-bit out. As the I/O ports contain the remaining registers, the device allows several data manipulation functions to be carried out in the ports rather than the other internal registers.

All 32 lines of I/O can be used for external memory addressing, offering a total capability of 128K bytes, equally divided between program and data storage. In addition, two of the lines can be used to form a simple universal asynchronous receiver transmitter, UART, serial I/O port.

Other features include an

internal vectored multi-level interrupt system, two timers and a pre-scaler for timing and event counting, and a single five-volt power supply requirement. Plans are in hand from Zilog for the introduction of an add-on module for the MDZ development system to accommodate the Z-8.

Similar plans are afoot for the Z-8000, the official designation for Zilog's oft-predicted 16-bit microcomputer. Currently planned to appear next June, the design would appear now to be settled, as the layouts for the production masks are being finalised.

Ungermann, without being drawn too specifically, offered the seminar delegates an interesting overview of the device. However, as already predicted (CW, October 13), its throughput capabilities will be broadly similar to that of the PDP-11/70 minicomputer, and will employ a similar architecture.

Its instruction set will be compatible at assembly language level with the Z-80 device, and it will offer such facilities as hardware multiply and divide. Available in either a 40 or 48 pin package, Ungermann predicted that in the latter version, it would be possible to directly address up to 8M bytes of memory. On the question of price, Ungermann would only state that it would be competitive with the LSI-11 CPU from Digital.

Practical guide for managers

PRODUCTION control systems are covered by two new books* from the National Computing Centre.

The first, part of the Computer guide series, is a practical guide which identifies problems and helps managers to get the best from their systems.

The guide is needed because, the NCC says, despite long experience in the field, industry still makes the same mistakes

especially during system implementation. The other book is an update of an earlier NCC survey of 12 production control packages.

Computer guide to production control implementation, £2.50. Practical guide to production control packages, Part 1, £5.00. Part 2, £5.00. Both books are available from the NCC, 11, The Quadrant, London WC2N 2LU. Tel: 01-252 2222.

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The ITT 3805 is a comprehensive and powerful programmable communications front-end processor for attachment to IBM mainframe computers. It provides flexible network control and enhanced networking without the need to change tried and tested applications or mainframe software.

The 3805 will also allow greater choice of communications techniques in the future and can show significant savings in network costs.

ITT 3230 Visual Display System

The ITT 3230 Visual Display System has been specifically designed to meet all the data communications needs of the Systems Designer, the DP Manager and, of course, the operator. It's very versatile, good looking and above all, cost-effective. No equivalent system offers so many features at a comparable price. The ITT 3230 with its diskette attachment is particularly suited to file enquiry and update although many will see it in a data entry role.

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10/11/77

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Stop Press: Computer Weekly continues to publish more product and recruitment advertising and has a higher fully requested A.B.C. (Audio Bureau Circulation) of 76,001 than any other U.K. computer publication. Additional 18,138 regular readers in Western Europe via the INTERNATIONAL EDITION which is published the 2nd week in every month excluding August and December.




Shifts

Grenville Morgan, the polytechnic director of computer services who is responsible for the development of the department, says that due to cuts of local government expenditure he is unlikely to be able to upgrade the hardware and will not be able to increase the size of the operations staff in the near future.

At present, the operators receive a 14% shift allowance, which will be increased to 18% should they agree to go to three shifts.



Exports now major part of Logica



A WIDE-CARRIAGE dot-matrix printer terminal introduced by Anderson-Jacobson, has been designed to provide a high level of print quality, at speeds up to 120 cphs. Called the A1840, it costs £1,095 in its basic

Products More OUTPUT from your INPUT

Dominant stand the show was without a doubt the shining silverball Computer City ICL, which occupied the central site in the computer hall and to which visitors were welcomed with the smiles shown here. Less anyone should criticise the hegemony of the UK computer industry for such a display of opulence, it should be pointed out that the stand will become the permanent showcase for the company's products at Hannover Fair in West Germany where it will also be among the most eye-catching exhibits at the show.

**A page in which users can air their
issues affecting day-to-day data
Edited by John Kavanagh.**

holistic

Since then the whole-body scanner has been introduced and more than 600 EMI systems have been installed in hospitals all over the world. The honours heaped upon its

A patient is positioned in the computerised scanner

is selected and the available shades of grey are distributed over the range, so that at any one time certain details are highlighted and others faded out. For example a scan of a chest slice can "focus" on either the ribs and vertebrae, or the lungs, or the air spaces within the lungs. The "focus" can be

The scanner makes a straight traverse across the whole of the scan section, taking readings as it goes. At the end of the traverse it revolves through an angle of 10° and begins another traverse. In all, 18 traverses are made and a total of 324,000 readings taken. The thickness of the slice of tissue scanned is determined by the width of the X-ray beam.

Pictures can be displayed from the disc on to the operator's display console. They can then be transferred, either selectively or automatically, to the magnetic tape which serves as an archive for scanner output. They can also be output to a

The Royal Marsden Hospital at Sutton, in Surrey, has a EMiscanner which has been up and running since July of this year. Since it is one of the two most important cancer research hospitals in the country, the Cancer Research Campaign financed the purchase of the scanner, but the hospital has to find the running costs, estimated at about £100,000 a year.

And the credit for "the greatest advance in clinical radiology since Röntgen discovered X-rays" belongs to Hounsfield, who invented the scanner, and Cormack, which helped develop



Professor Shiu-Chang Loh

Professor Shiu-Chang Loh

They are of the opinion that by pre-editing, the semantic and lexical analysis will be much simpler and more effective. In theory, if the source language can be pre-edited to make it

The meaning conveyed in the original must be preserved in the translation; significant patterns in the source language must be identified precisely and have corresponding patterns in the target language. A machine dictionary, now containing about 30,000 items, is used for the translation of patterns occurring in source text to the

Source language analysis and

First, the relationship of the items is determined to establish the various parts of speech. An analysis is carried out classifying the items according to grammatical categories; items are rearranged to form a pattern of an English sentence, the relative order being dependent on the function of the phrases and clauses. Finally, the target codes for the sentence are determined based on the parts of speech of the items and their grammatical

The routines are written in Standard Fortran and currently run on an ICL 1904A; transfer to other machines has been a major design criterion. The average speed of translation is about 60 words per CPU second, and the

Many problems encountered in this field are dependent on further research in computational linguistics. More sophisticated models have to be designed than those which exist today. As far as machine translation itself is concerned, the EEC plans may result in a revival of interest in Europe.



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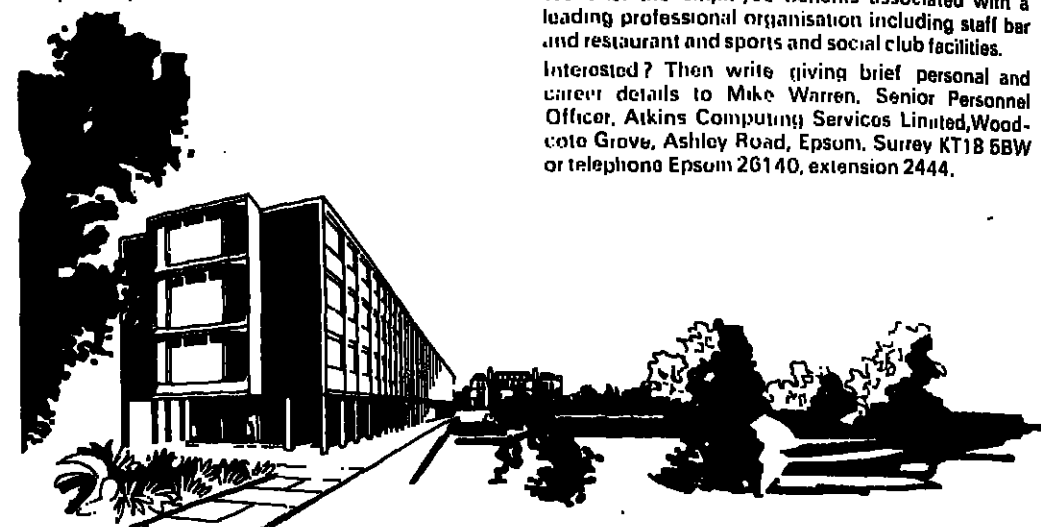
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Contact: Mike Creamer

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London & NW. up to £8,500

Our client, a well established name in the process control and automation industry, has opportunities for engineers with a software background to join their development teams.

Candidates must have several years experience in programming preferably in FORTRAN, CORAL, RTI/2 or ASSEMBLER and be able to demonstrate a sound background of industrial control systems. Salaries and fringe benefits are above average with the opportunity for advancement and travel.

Contact: Jim Baker

Analyst/Programmers

West of London neg. circa £8,000

Applications are invited from those who can make an immediate contribution in a demanding technical role. Essentially you d.p. experience should have covered a broad spectrum of commercial or manufacturing applications, and a thorough knowledge of an Assembler level language. Specialist skills, such as real-time development on minicomputers will be highly valued. You will be working on possibly the most advanced manufacturing control system outside the U.S.A.

The client is looking for well educated people, with out-going personalities, who have the ability to document clearly and to work well under pressure. These positions offer a varied and challenging working environment and the opportunity for the ambitious programmer to join a small but highly professional team.

Contact Margaret Stevens

Programmers

Surrey c. £4,000

A large international finance organisation has vacancies for Programmers to work on sophisticated real-time and teleprocessing systems.

Applicants must have at least six months experience of a high level language, such as COBOL, PL/I or BASIC, in a commercial environment. An extensive training programme is available.

Salaries negotiable according to experience. Excellent fringe benefits.

Contact: Jim Baker

Real Time Computing in The Health Service

At the North Staffs Hospital Centre we have vacancies in the exciting area of hospital management systems. We employ an I.C.L. based computer network with over 100 terminals in real time running 24 hours a day. Many of the applications are pioneering and employ innovative real time techniques.

We require the following staff:

SENIOR SYSTEMS ANALYST

Scale 14 £4536 - £5813 + £312 + 5% (maximum £208) supplements.

SYSTEMS ANALYST

Starting scale 4 (£3534 - £4344) with prospect of promotion up to £4983 + £312 + 5% (maximum £208) supplements.

Both posts require at least 5 years in-depth programming and systems experience. The Senior Analyst will be capable of leading multi-disciplinary teams in successful implementation. Much of his/her work will consist of

user liaison.

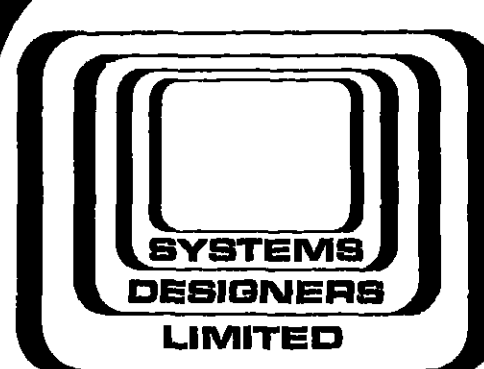
PROGRAMMER/TRAINEE PROGRAMMER

Programmers start at £2591 to £3534 + supplements. Trainees start at £2181 to £2591 + supplements. Future advancement, commanding salaries up to £4983 will depend on ability and experience gained.

The successful programmer will be working in an advanced multi-processor real time environment, using I.C.L. and Data General equipment, with both high and low level languages where our professional approach ensures the highest standards.

For further particulars and/or an application form please apply to the Director of Computing Service, North Staffordshire Royal Infirmary, Prince's Road, Hartshill, Stoke-on-Trent ST4 7JN. Telephone Stoke-on-Trent 49144 ext. 4540.

North Staffordshire Health District, Staffordshire Area Health Authority

**ADVANCED COMPUTING SYSTEMS**

PROGRAMMERS AND SYSTEMS ENGINEERS UP TO £6,500

Systems Designers Limited is a leading, and expanding, British systems consultancy specialising in mini and micro computer applications.

Growing demand for our high quality service has created a full order book, with exciting opportunities for top programmers and systems engineers. Current projects are challenging and rewarding, while rapid progress is possible for top people. Company policy of full participation and involvement of all members has resulted in a dynamic environment and wide career challenge.

Head office is in Frimley, Surrey, and we have a nearby centre for producing turnkey systems. We are a private company, with substantial financial backing. Excellent benefits and working conditions include profit sharing, optional BUPA and pension scheme, and a lively Sports and Social Club. Assistance is given with removals where necessary. Opportunities will occur for those interested in working in Europe.

Head office is in Frimley, Surrey, and we have a nearby centre for producing turnkey systems. We are a private company, with substantial financial backing. Excellent benefits and working conditions include profit sharing, optional BUPA and pension scheme, and a lively Sports and Social Club. Assistance is given with removals where necessary. Opportunities will occur for those interested in working in Europe.

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Carlsberg**OPERATIONS CONTROLLER**

We are looking for an Operations Controller with some systems analysis experience to assist in the day-to-day running of a small ICL 2903 installation.

It will be necessary as part of the duties to operate the computer and Direct Data Entry equipment.

The successful applicant will be aged 25 to 30 and have several years' experience of DCL techniques.

Please apply in writing to: Personnel Department, Carlsberg Brewery Limited, P.O. Box 48, 140 Bridge Street, Northampton NN1 1PZ.

BRISTOL SOUTH WEST SOUTH WALES

Bristol:
Project Leader (ICL) £6.8K
Analyst Prog (Support) £6.8K
Analyst (ICL) £5.1K
Analyst (ICL) £4.5K
Analyst (IBM) £4.5K

Analyst Prog (PL1 + CICS)
£4.5K
Analyst Prog (BAL Cobol)
£4K
Programmer (ICL) £4.5K
Programmer (Various) £3.4K
Operator (IBM + ICL)
£3.5K

South West WILTS & GLOUS)
Analyst (ICL) £5.5K
Analyst (ICL) £5K
Analyst (Support) £4K +
CAR
Analyst Prog (Cobol) £4.2K

South Wales
Analyst (Support) £4K +
CAR
Analyst Prog (RPGII) £3.5K

STOP PRESS (South Coast)
Analyst (IBM) £5K
Prog (OS/Cobol) £5K

Programmer (Support) £3.5K + CAR
Programmer (Various) ENEG

Programmer (DEC/Coral) ENEG

Programmer (DEC/Coral) ENEG

Programmer (DEC/Coral) ENEG

Programmer (DEC/Coral) ENEG

Programmer (DEC/Coral) ENEG

Programmer (DEC/Coral) ENEG

Programmer (DEC/Coral) ENEG

**SALES EXECUTIVES
TIMESHARING SERVICES
AND INFORMATION
SCIENCES**

HOLLAND (Amsterdam) Circa D.F1 73,000
GERMANY (Frankfurt and Munich) Circa D.M. 69,000
BELGIUM (Brussels and Antwerp) Circa B.Fr 1 Million
U.K. (London) Circa £10,000
(SPLIT 70% BASIC, 30% COMMISSION PLUS COMPANY CAR)

Our Clients are the World's largest independent firm in information sciences and continue to grow at a phenomenal rate. They now employ over 8,400 personnel worldwide and had a turnover in excess of \$24 Million in their last financial year.

Services offered by the company include systems programming, application programs, requirements analysis and systems design, facilities management, communications systems, systems engineering, software products, educational services, government and industrial systems and information network services.

We have been asked to identify suitable candidates to fill a number of vacancies for salesmen in Europe and the U.K. They will be selling the company's timesharing services, primarily for financial applications and as such, should have a good knowledge of the timesharing market-place in their particular country. Applicants should preferably be nationals and total fluency in the country's language is essential.

These are exciting and rewarding opportunities to join one of the fastest growing companies in the computer industry today. An excellent future is assured for any salesman who can show the ability to achieve targets and develop new accounts.

Interested applicants should telephone the Advising Consultant and interviews will be arranged in the relevant countries towards the end of October.

Reference CW 310/1

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.
01-353 6187 (Office Hours)
01-353 1436 (Ansafone Service)

Hutton**PROGRAMMERS**

LONDON AND HOME COUNTIES

Salaries to £5,500

REAL-TIME MINIS

ON-LINE MAINFRAME

Interesting opportunities exist for programmers with either COBOL or commercial ASSEMBLER level language experience who can demonstrate a high degree of self-motivation, user acceptance and proven or potential supervisory ability.

The likely candidate profile is as follows:

- * At least eighteen months' relevant programming experience.
- * A strong commercial awareness.
- * A Degree or equivalent preferred.
- * The ability to communicate effectively.
- * The ability to accept responsibility quickly.
- * Ambitious.

Candidates who feel they match the above specification are invited to contact the Advising Consultant to arrange immediate interviews. Please quote the relevant reference number.

Reference CW310/3

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.
01-353 6187 (Office Hours)
01-353 1436 (Ansafone Service)

Hutton**TIMESHARING — COMPUTER
BUREAU
BRANCH MANAGERS**

FARNBOROUGH, HANTS -
FAREHAM, HANTS
SHEFFIELD, YORKS
INCOME c £8,500 PLUS CAR

Our Clients are one of Europe's leading timesharing bureaux with more than a dozen offices throughout the U.K. where they currently employ some 250 people and have a turnover in excess of £3M p.a. They are committed to increasing their commercial systems business and are looking for three senior people to join their organisation and assume total revenue responsibility for new and existing business and for sales and support staff within their branches.

Candidates are likely to have the following qualifications:

- * A positive front-end sales background, ideally within the timesharing industry.
- * A proven successful sales track record within this or a directly comparable environment.
- * Capable of identifying new business areas, particularly within a commercial environment.
- * Preferred age group 28-35.

**CUSTOMER CONSULTANTS
BRISTOL AVON**

Income c £5,500 plus car

In addition, they are looking for suitable candidates to fill important field customer support roles in the West Country. Candidates will probably have the following background:

- * Programming or systems background in the timesharing industry.
- * Able to communicate with customers in a sales environment.
- * Preferred age group 25-35.

Customer consultants report directly to the branch managers and branch managers in turn to the regional manager. Branch managers will have responsibility for both sales and support personnel within their branches in addition to a direct field sales role. Career progression for successful candidates will be directly related to performance.

Applicants interested in these excellent opportunities should telephone the Advising Consultant quoting the appropriate reference number.

Reference CW 310/2

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.
01-353 6187 (Office Hours)
01-353 1436 (Ansafone Service)

Hutton**FIELD SERVICE
ENGINEERS**

Salary to £4,500 plus allowances plus car

LONDON AND HOME COUNTIES

Our Clients are one of the world's leading manufacturers of computers including technically advanced stand-alone computers, mini-computers and teleprocessing systems. Due to continued expansion within the U.K. they are looking to recruit dynamic engineers responsible for maintaining equipment within London and the Home Counties.

The preferred candidate profile is as follows:

- * Proven experience in servicing computer systems.
- * The ability and desire to work autonomously.
- * Probably an HNC in Electronics or equivalent.

While these features are important, we believe that there is no substitute for practical experience.

Applicants must be confident in their own abilities and mere "board-swappers" need not apply.

Please contact the Advising Consultant quoting the appropriate reference number for further information regarding these excellent opportunities.

Reference CW310/4

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.
01-353 6187 (Office Hours)
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Hutton

- ☐ PDP11
- ☐ CORAL
- ☐ MACRO
- ☐ SYSTEMS/
SOFTWARE
ENGINEER
- ☐ TRAFFIC/
SYSTEMS
EXPERIENCE
- ☐ TELE-
COMMUNI-
CATIONS

TWO OUT OF SIX?

If you can tick two (or more) of the boxes because you have relevant experience our client would want to talk to you. And, equally important, you would want to talk to him.

His need is for real-time systems & software engineers who are interested in working on advanced technology projects for the U.K. and export markets.

You would be interested in this field of work, are looking for a salary of between £3,500 to £5,500 p.a. now, want to join a company which can offer a variety of work and provide good working conditions in a particularly pleasant area. Further, you would like to talk to someone who won't keep you hanging about for weeks.

For a brief chat now please ring John Nolan at Richard Owen Advertising on 01-638 1891

Richard Owen Advertising

Cross Keys House, 56 Moorgate, London EC2R 6EL

Fortran Programmers

speak to our Sperry Univac 1100 in Bracknell

Our Design Automation section has vacancies for programmers with a minimum of two years experience.

Applicants should have an engineering background and want to develop their careers further into the field of design automation, or have already worked in one or more of the following areas:

- * Electronic Circuit Design
- * Electronic Circuit Analysis
- * Thermal Analysis
- * Printed Circuit Board Layout
- * Numerical Control

Future plans for the section include the development of inter-active systems using mini-computers to front and the Sperry Univac 1100/11.

Experience of this machine would be an advantage, but training will be given where appropriate.

Competitive salaries will be in line with ability and experience and Sperry offers the usual large company benefits.

Write to or telephone Stephanie Wansidge, Personnel Officer, Sperry Gyroscope, Downshire Way, Bracknell, Berks RG12 1QL. Tel: Bracknell (0344) 3222. Quote Ref C/201077.



WEST LONDON

1900 SOFTWARE SUPPORT SPECIALIST

SALARY to £6,500 PER ANNUM PLUS MAJOR COMPANY BENEFITS

Opportunity for a Software Specialist to join a Company, having an international reputation that is unsurpassed in their field.

The successful candidate will have some four years experience in programming 1900 PLAN. Practical knowledge of George II and Communication Manager is also desirable.

A Real Time Invoicing System is due to go live and further development of on-line systems is planned. Major upgrading of hardware capability is scheduled for 1978.

He/She will join a team of five, enhancing and maintaining the Operating System, evaluating system performance, developing communications software and providing technical advice to application teams.

The Company staff enjoy a very pleasant working environment and staff relations, together with attractive fringe benefits including subsidised restaurant.

PLEASE TELEPHONE WITHOUT DELAY OR SEND A CAREER RESUME TO THE ADDRESS SHOWN.

Ref. CW918



Crown House, Morden, London SM4 5EU

recruitment division

01-540 8311

24-hour answering service

HOWARD

BELGIUM

We are seeking

PROGRAMMERS

in the following major area.

1. **HARDWARE TEST SUPPORT** to aid the preparation of software proving a mini computer system. The tests will be written in a real time variant of PL 1. Programme production will be undertaken on an IBM 370/168 configuration under OS/MVS using TSO. Some mini experience in a real time environment would be helpful as would a knowledge of ASSEMBLER. (Ref. DCO/41077A)

2. **INTEGRATION TEST PREPARATION** (mini based). General knowledge of mini applications in a real time environment (ideally familiar with C11/C1MSA) able to debug at machine level on a teletype. Programs written in a real time variant of PL 1. Experience of working under pressure is essential. We require practical individuals with the ability to apply time and to get a Computing systems up and running with minimum delay. (Ref. DCO/41077B)

3. **INTEGRATION TEST PREPARATION** (on host IBM mainframe) required up to date IBM JCL experience preferably on a 370/168 with MVS running TSO. A knowledge of PL1 together with some experience of mini computers would be desirable. (Ref. DCO/41077C)

4. **SOFTWARE SUPPORT** to aid in preparation of software (written in mini ASSEMBLER) to input data from special peripherals - familiarity with a mini computer ASSEMBLER language in a real time environment is essential. Some exposure to FORTRAN and IBM JCL is desirable. (Ref. DCO/41077D)

c. £12,000 + p.a.

HOLLAND

SYSTEMS ANALYST

age 30+ should have several years' real-time process/plant control and STRONG PROGRAMMING background using PDP11's, RSX11M and FORTRAN experience required. PDP assembler and asset. (Ref. BJ9977)

c. £9,000 p.a.

FRANCE

TECHNICAL AUTHORS

(PARTS)

A number of authors are required for a major publications development project. A strong background in DP is essential for these positions and knowledge of the following subjects would be particularly relevant.

- Data base management
- JCL
- Communications Software
- Interactive and RJE systems
- Programming languages COBOL, FORTRAN or RPG2

(Ref. DECO/01087)

£8,000 p.a.

FRANCE

PROGRAMMER

Mini computer programmer with knowledge of photo typesetting and use of intelligent terminals required for project in Paris. (Ref. DCO/25077)

Apply in first instance to G. Ryan (01-853 4088)
Overseas Recruitment Consultants, Employment Business Section
Howard Organisation International Limited
Manor Way, Borehamwood, Herts



The Growth Company

It is through continuing growth that new and expanding career opportunities are created. With particular emphasis overseas, many new openings have been created in Logica's Management Systems Group. We confidently expect to increase both the number of clients and the geographical spread. Our clients in the United States, New Zealand, Norway, Libya, Singapore and Finland include some of the world's largest and most successful banks, companies and organisations. They rely on Logica's services because of our international reputation in:-

Turnkey implementation of commercial systems

Many of our projects are based on mini-computers, and our reputation is particularly high in the development of banking systems. At the heart of many of these projects is our TRADER foreign exchange product.

Development of systems software

The diversity of projects covers:-

- the production of total systems with novel graphics and communications content
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- supply of language compilers and low level software for mini, micro and mainframe equipment

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We specialise in:-

- computer performance management, based on the use of hardware and software measurements and advanced simulation techniques
- requirements analysis and system selection

planning the exploitation of distributed processing techniques.

Our considerable success means that we urgently need experienced people who feel they can contribute to these exciting opportunities. We want professionals with initiative who will welcome responsibility and some opportunity for overseas assignments.

Call Margaret Neagle, the Group Personnel Officer on 01-837 9111 to discuss these opportunities with Management Systems Group managers or send your career summary using Freepost and quoting the reference appropriate to your area of interest to:

Logica Limited
Freepost
PO Box 4SE
84 Newman Street
London W1A 4SE

Project Managers

£6500-£9500

Ref. MS/2/BS1

With at least 6 years in DP and a successful track record in managing technically challenging projects to timescale and budget are essential; proven ability to motivate people and to communicate successfully with top management is important. Specialist skills in one or more of the following areas:-

- minicomputer implementation
- banking and finance
- text processing systems

would be an advantage.

Software Designers

£5000-£7000

Ref. MS/2/SS

To design total systems with novel and demanding software requirements. Also to design special software environments as a base for our commercial systems. A thorough knowledge of computer architecture and state-of-the-art software techniques is essential preferably based on more than one machine. Experience of minicomputer and communications software is particularly relevant.

Banking Analysts

£5500-£8500

Ref. MS/2/BS2

We need senior and junior analysts with a minimum of 2-3 years experience of banking systems, preferably in the implementation of branch accounting or foreign exchange systems. A detailed knowledge of operations involved in both front-office and back-office procedures is essential.

Consultants

£5500-£9500

Ref. MS/2/DPE1

We need experienced professionals who have a broad base of commercial DP experience with users or computer manufacturers. Some management experience will be an asset. The ability to use sound technical knowledge in the formulation of business judgements for clients and to be able to communicate effectively with all levels of management is essential.

Performance Analysts

£5500-£9500

Ref. MS/2/DPE2

Experience in the use of performance measurement and simulation techniques allied with a thorough knowledge of either IBM 370 or ICL 1800 and 2900 hardware and software capabilities is essential.

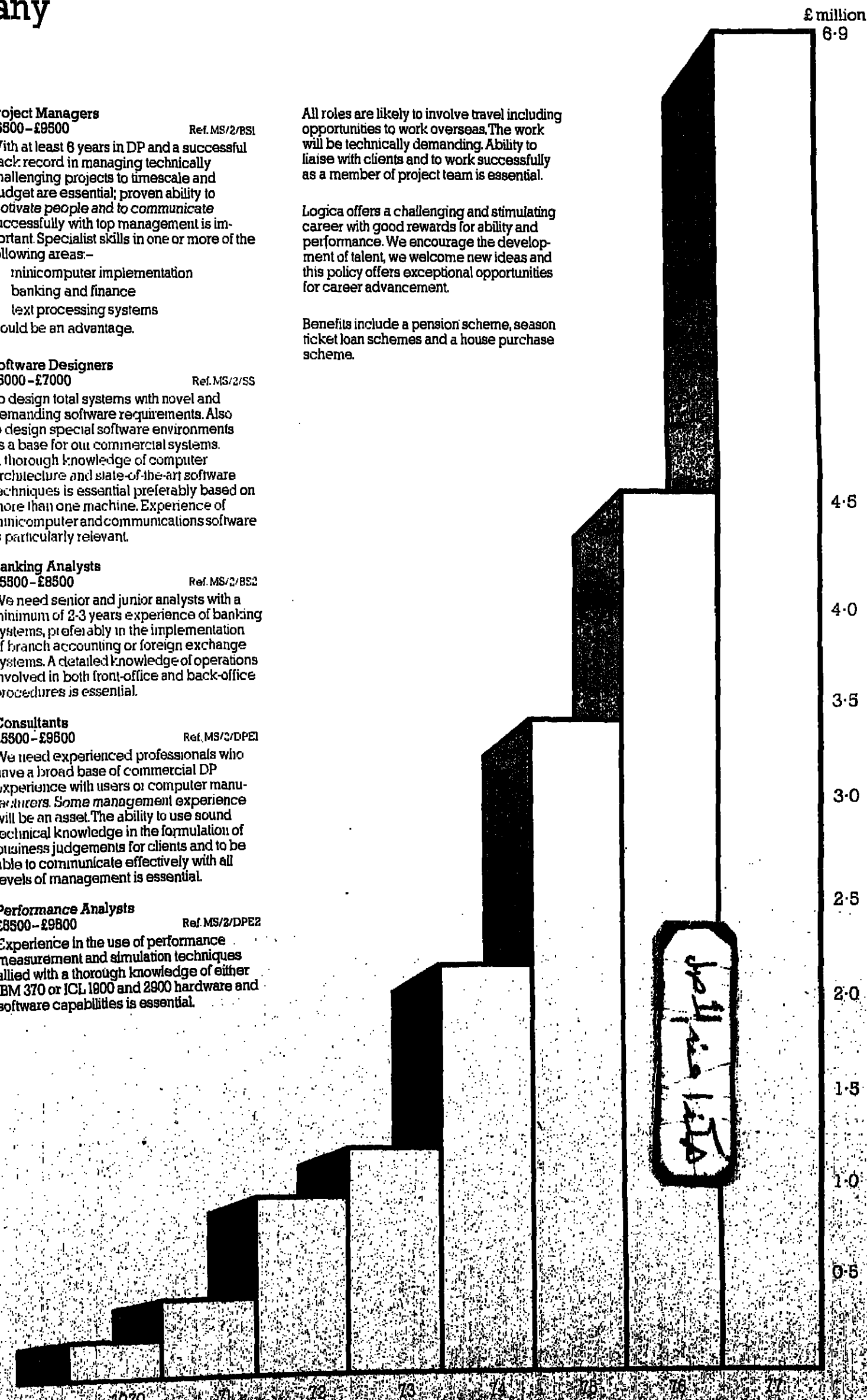
Logica
growth
revenue

£ million
6.9

All roles are likely to involve travel including opportunities to work overseas. The work will be technically demanding. Ability to liaise with clients and to work successfully as a member of project team is essential.

Logica offers a challenging and stimulating career with good rewards for ability and performance. We encourage the development of talent, we welcome new ideas and this policy offers exceptional opportunities for career advancement.

Benefits include a pension scheme, season ticket loan schemes and a house purchase scheme.



SOUTH BIRMINGHAM PROGRAMMER/ANALYSTS SALARY c£4,400 P.A.

We have been retained by our clients, a large distribution concern, to recruit experienced PROGRAMMERS who have a sound knowledge of SYSTEMS within a commercial environment. The successful candidate will work as part of a small, friendly team and be housed in a modern, award winning building.

Successful applicants should:-

- * be fluent in COBOL, preferably but not essentially Honeywell
- * have a minimum of two years' commercial programming experience, ideally with some systems experience
- * be of mature personality.

Normal large company benefits apply including discounts on all products and heavily subsidised meal facilities.

Interested candidates should contact without delay:-

ANDREW CARTER 021-236 3781 REF. NO. CW/10/10

SOFTWARE SALES Northern Home Counties & London to: 8K + CAR + super benefits

Our Client is a privately owned Company which supports and sells an integrated series of products. These products enjoy acceptance in many major main-frame installations, and are generally regarded as being the most complete and best supported in their particular application areas.

THE COMPANY IS GROWING DRAMATICALLY, AND THIS IS A NEW SALES TERRITORY. THE POSITION WILL APPEAL TO A SYSTEMS/ENGINEER TYPE OF PERSON WHO IS SEEKING A DIRECT SALES ROLE.

Candidates must have:

- * a sound technical background from within a main-frame environment, with ideally, a knowledge of 370 or 1900 hardware
- * if not sound direct sales experience within a data processing environment, then the correct personal motivation, presence and attitude to succeed in such a job.

This is an unusual opportunity to move into direct sales from a technically biased background. The Company is a much enlightened employer, and offers an exceptional employment package.

CONTACT: REG HEATH on: 021-236 3781 REF. CW/10/11

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BIRMINGHAM 021-236 3781 FREEPOST
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MANCHESTER 061-833 0676 FREEPOST
Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-935 0671 FREEPOST 6
Freeport 6, 102, Blandford Street, London W1E 1JZ



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PROGRAMMERS
BUCKS
RPG II
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Kenya

Kenya Airways offer the following challenging opportunities at its data processing centre in Nairobi. The provision of a complete management information service is the long term aim and recent and current developments, include wagon, stock, accounting and personnel systems.

Systems Analyst/ Senior Systems Analyst

To be responsible for the design, specification and implementation of systems for an ICL 1900 computer.

Senior Programmer

Required for the programming in PLAN and COBOL for ICL 1904E and 1905F computers.

Candidates, aged up to 45, must be educated to 'A' level standard and have at least 4 years relevant experience. A degree or professional qualification would be an advantage. Salaries, which include a substantial tax-free allowance paid under Britain's overseas aid programme, are equivalent to £3000 - £3250 pa for the Systems Analyst, and £4500 - £5370 pa for the Senior Programmer. Basic salary attracts 45% gratuity.

Benefits for both posts include free passages, generous paid leave, children's holiday visit passages and education allowances, subsidised housing, appointment grant and interest-free car loan.

The terms on which civil and public servants may be released if selected for appointment will be subject to agreement with their present employers.

For full details and application form visit quoting appropriate reference to

Crown Agents
The Crown Agents for Overseas Governments and Administrations, Appin Street, London SW1P 3JQ

INTERNATIONAL BANKING

We are a major American Bank long established in London. Presently we are expanding our activities worldwide and particularly in Europe. Major data processing projects are currently being developed and more are planned, based mainly on IBM 370 and SYSTEM 3 COMPUTERS.

As a result of this activity we are expanding our International EDP Audit team and can provide excellent career opportunities for the following:

PROJECT LEADER - AUDIT SOFTWARE

To lead a small team developing audit software for IBM 370 and SYSTEM 3 banking systems. Candidates should have had project leadership experience, preferably with an IBM 370 system. Knowledge of SYSTEM 3 an advantage.

IBM 370 PROGRAMMER

Experienced in Assembler and COBOL. Good knowledge of DOS/VS important. Knowledge of IBM software and teleprocessing experience an advantage.

Both successful applicants will be involved initially with audit software development, and will eventually participate in all aspects of EDP auditing. Occasional European travel will be required.

An excellent salary will be offered for these positions, together with the usual benefits associated with a first-class bank.

Candidates, male or female, who meet the above requirements should identify the position for which they are applying and send full details of their age, education, experience and current salary to Box No. RD 4279, o/o. Extel Advertising & PR Limited, Pemberton House, East Harding Street, London EC4A 3JD. The names of any banks to whom you do not wish your application forwarded should be printed clearly on the back of the envelope.

SLOUGH COLLEGE OF
HIGHER EDUCATION

PROGRAMMER

required. Salary on scale to
13,512 per annum

Please send a stamped addressed
envelope for further details and an
application form to

The Chief
Administration Officer
Slough College of
Higher Education
Woolington Street
Slough SL1 1YD

ELECTRONICS TECHNICIAN GRADE 5

A Technician is required in the
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range of electronic work with
emphasis on audio-visual recording
equipment, laboratory maintenance
and control applications. Experience
in the use of electronic equipment
and a knowledge of the principles of
electronics are essential. The post is
full-time and desirable. The post is
permanent and pensionable and
employment will be on the scale
of 12,100 to 14,000 p.a. Further
details are available from the
Psychology Department, University
of Warwick, Coventry CV4 7AL, quoting
Ref No. 11/21/77 by 31st October
1977

SENIOR PROGRAMMERS £5500 to £6500 pa

Arising from the promotion of the
previous post holders, applications are
invited for appointments in application
development project groups. Candidates
should have at least three years experience
of commercial application programming,
preferably with PL/1 for an IBM 370 Computer,
running under OS/VS. They should also be
able to demonstrate the competence to lead
small teams of programmers.

The successful candidates will be based
at the Board's Computer Centre near the
Elephant and Castle.

Applications, giving full details of
relevant experience and quoting reference
CW/10/SP77 should be sent to:

Mr R Burridge
Manager, Computer Services
LONDON ELECTRICITY BOARD
PO Box No. 74, London SE1 6NL



MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

PROGRAMMERS BUCKS £6 1/2 K

The success of this software house is all down to the high calibre staff they recruit, and is reflected in the generous salary and profit sharing incentives offered. They undertake commercial applications in the Greater London and Buckinghamshire areas. These include the development and implementation of mini and mainframe systems. If you have mini experience and are conversant in FORTRAN, BASIC, or ASSEMBLER or have IBM M/F experience in IMS, CICS and have used COBOL, PL1 or ASSEMBLER then give us a ring.

Contact Pam Quinlan

ENGINEERS to £4 1/2 K SCOTLAND

A well respected established company has recently created two new roles within its expanding communications department. The microwave engineer will specify systems according to customer requirements - a pre-sales role. Relevant design experience is therefore required, and preferably a degree or similar qualification in electronics. The technical documentation engineer will liaise with test engineers and correlate their findings to produce reference and sales information. Experience in the data transmission field is essential, supported by an HNC. Both positions require good communicators with initiative for this stimulating but demanding environment. Relocation expenses are available where applicable.

Contact Peter Gorton

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

SALES support Neg. c £5 1/2 K

W. LONDON based + car allowance + bonus

If you can honestly answer yes to the following questions, our client would like to hear more about you.

- * Able to communicate confidently and effectively at all levels.
- * Can work under pressure in a competitive environment.
- * Have experience in business commercial applications.
- * Flexible, adaptable and able to accept responsibility.

The successful candidate will be the computer pre and post sales support specialist responsible for new business clients in Greater London. He will of course have a solid computer background. Prospects within this expanding organisation are excellent, especially for the ambitious.

Contact Rowland Middleton

ANAL/PROGS to £6K S. LONDON

Suitable applicants for these very attractive positions should have at least 2 years experience in COBOL programming and at least 2 years in system analysis. Personality, intelligence and a professional attitude are as important as the relevant experience, and preference will be given to applicants with a financial or general insurance background.

This multi national company is in the process of installing a 370/115 with T.P. equipment and offers plenty of scope for career development within its enterprising organisation.

Contact Rowland Middleton

MANAGEMENT & EXECUTIVE SELECTION

SYSTEMS PROGRAMMERS ANALYST/PROGRAMMERS

SALARY £4,500 to £7,500 p.a.
with additional benefit

Almond Management Services Ltd. have specialised with an acknowledged degree of success in Mini-Computer applications currently concentrated in the banking and financial sectors.

Following sure and steady expansion we are currently recruiting efficient and mature personnel to fill interesting and demanding assignments in the UK and the Americas. There are a range of opportunities from one year's experience upward. Tel. Graham Russell on 01-681 1234 or write: Almond Management Services Ltd., 260 Brompton Road, London SW3 2AT.

UNIVERSITY OF MANCHESTER REGIONAL COMPUTER CENTRE

Director: Professor Gordon Black

Applications are invited for the following vacancies:

SENIOR PROGRAMMER to lead a small team responsible for the development and support of the interactive system based on the CDC CREW 72 running the NOS operating system. Current project areas include system performance analysis, file storage management and the development of a new front-end processor. The successful applicant is expected to bring a long-term strategy for interactive computing in the University. Applicants should have a degree, together with a sound experience of programming in a high level and assembly language. Experience of either real time, message passing or a general purpose time sharing system. Experience of CDC systems would be an advantage.
Salary £5,433.65 p.a. USS Ref 166/77/1/CW

TWO PROGRAMMERS required in the development and support of the interactive system based on the CDC CREW 72 running the NOS operating system. The successful applicant is expected to bring a long-term strategy for interactive computing in the University. Applicants should have a degree, together with a sound experience of programming in a high level and assembly language. Experience of either real time, message passing or a general purpose time sharing system. Experience of CDC systems would be an advantage.
Salary £5,433.65 p.a. USS Ref 166/77/2/CW

PROGRAMMER to be responsible for the development and support of the interactive system based on the CDC CREW 72 running the NOS operating system. The successful applicant is expected to bring a long-term strategy for interactive computing in the University. Applicants should have a degree, together with a sound experience of programming in a high level and assembly language. Experience of either real time, message passing or a general purpose time sharing system. Experience of CDC systems would be an advantage.
Salary £5,433.65 p.a. USS Ref 166/77/3/CW

PROGRAMMER/ANALYST

c. £4,500 with attractive fringe benefits

Applicants are invited for a sole programmer/analyst with scope for personal initiative in a small but well organised team developing an on-line Banking package. We are a well-established and expanding British Bank in the City.

The successful applicant, male or female, will preferably be in the 25-35 year age group with 3 years' experience in Micro/Assembler to include DEC PDP11 under RSX II operating systems gained in a Banking or Financial environment.

Those interested should write to:

B. M. Stenale-Bennett
The United Bank of Kuwait Ltd.
3 Lombard Street, London EC3V 9DT

GPG PRODUCTS LIMITED DUNSTABLE

Systems Analyst Salary around £4500

An analyst is required to join a systems development team using an ICL 2903.

The job requirements are to examine, recommend and help implement new computer based systems within the group starting in the production control area. Development to on-line systems is anticipated.

Applicants, male or female, should have a good standard of Education, training and experience in systems analysis and a desire for responsibility and action.

Computer based systems are playing an increasingly important role in the company's administration and this position offers good prospects, job interest and the opportunity to gain valuable systems experience. Benefits include an excellent non-contributory pension scheme, incorporating free life cover and four weeks annual holiday.

Please write or telephone for an application form to: Miss A. Copper, Personnel Department, GPG Products Limited, Cranford, Blackdown, Leamington Spa, CV32 8RD. Telephone: 0928 27933. A member of GPG Holdings Limited.



Operators to Shift Leaders £2,000-£4,000 (incl.)

LONDON & HOME COUNTIES

We have many vacancies covering all types of machines and locations. Some firms will train from one manufacturer to another. Remember these positions are for shift working only. Hurry while stocks last. CW42/1. Annette

Systems Consultants £6,000-£9,500

CENTRAL LONDON

Seven large well-established consultancies wish to recruit systems people with all-round experience on third generation equipment and the right personality to deal with clients who require a first rate service. Technical communications consultants are also required where in-depth implementation experience of IBM or ICL T/P message switching networks etc., are essential. Excellent fringe benefits and prospects. CW42/2. Michael.

Mini Computer Programmers to £6,950

U.K.

Experience is required now. A very large number of vacancies are registered where a knowledge of Assembler or communications experience is essential (VBC programmers would also be considered). Opportunities exist in S.W., N.W. or W. London, Surrey, Herts. and Manchester in this exciting and rewarding field. There have also been registered some overseas posts to people with 5 or more years in mini computers. CW42/3. Michael.

Junior Programmers £2,500-£3,750

LONDON, HOME COUNTIES

Only one year's experience? Then you are in great demand. We have a large selection of attractive companies who need people like you. CW42/7. Annette.

Time Sharing Programmers to £6,000

C. LONDON

If you have had time sharing experience involving the use of FORTRAN, BASIC or ASSEMBLER, then we have four very exciting positions who would offer you a challenging job in a pre- or post-sales support. Some offer overseas travel opportunities. CW42/8. Michael.



DATA EXPRESS HOUSE
PROSPECT PLACE
HEATHFIELD TERRACE
CHISWICK W4 3BR

Appointment Consultants

01-995 3883 or
01-958 6138 evenings

01-995 3883

LONDON
HILTON HOTEL
October 24th & 25th
between
Noon and 8 p.m.

IBM DOS or DOSVS Assembler Programmers

SDI would like
to meet you

We shall be at the London Hilton Hotel in Park Lane on October 24th and 25th, and invite you to drop in for an informal chat.

We would like to tell you about SDI, our research and development program, and the vacancies that currently exist, both in the U.K. and abroad, for senior and junior programming staff.

We'll be there between noon and 8 p.m. and look forward to seeing you.

SDI

Due to production expansion, Cummins Engine Company Limited, a leading manufacturer of high speed diesel engines, invite applications for the following positions:

Systems Analyst Programmer

Candidates should have had at least 3 years experience as a Systems Analyst/Programmer on IBM 370 under OS using PL1, having Data Base experience and possess computing degree or equivalent.

Duties will include researching, designing and programming, also implementation of computer systems. Maintenance and reviewing of existing systems.

Applications in writing to:

CUMMINS
The Employment Supervisor
ENGINE COMPANY LTD.
Shotts,
North Lanarkshire, ML7 4JT.
Telephone SHOTTS 20291

INSTEM

INSTEM supplies computer and microprocessor based systems for a wide range of Industrial and Laboratory Automation applications worldwide. We currently require:

SENIOR PROGRAMMERS

Applicants should be of graduate level and should have several years' successful project experience utilising minicomputers. Knowledge of RSX11 and Fortran would be a definite advantage.

PROGRAMMERS

As with the senior positions, applicants should be of graduate level. However, for these positions 1-2 years' relevant programming experience will be required.

APPLICATION ENGINEERS

The applicants should have several years' experience in the design and implementation of control and monitoring systems for a wide range of industries. Up-to-date knowledge of technology, particularly in the use of microprocessors is a principal requirement. The Company, which is a subsidiary of Kratos, is based in the pleasant country town of Stone, Staffordshire, and from our formation in 1969 we have achieved significant growth and created exciting opportunities. These posts will attract good salaries, with regular reviews offering opportunity to work in a challenging and expanding environment.

Please write or telephone (0785 83 2131)
Hilary Prosser, Instem Limited,
Mount Road Industrial Estate
Stone, Staffs, ST15 8LX

Move out and move up

If you're interested in developing your career with a progressive, expanding, computer-oriented company, you should consider the advantages of a move to Quinlan Hazell. As market leaders in the growing replacement motor component industry, we can offer you the chance of sound career development within a major international group, allied to the advantages - environmental and economic - of a beautiful North Wales coastal resort.

Don't assume that, because we are where we are, the work will be any less demanding than similar positions in major centres. It will demand an approach as professional and dedicated as any city centre outfit. Our Systems Services department provides vital support in the manufacturing, wholesaling and retailing aspects of our business through a national network of terminals linked to a 192K 1904S. We're heavily committed to the development of new projects and we're now looking to strengthen our team with keen men and women who want to grow with an expanding organisation.

Project Leaders to £6500. To lead teams of analysts in the preparation of commercial systems specifications. Must have considerable project experience and some supervisory experience. A background in leading multi-discipline project teams would be an advantage. Late 20's/early 30's.

Senior O.R. Analyst c. £5,500; O.R. Analyst c. £4,600. Providing specialist skills to multi-discipline teams and occasionally leading specialist project teams, controlling and planning the use of O.R. resources. For the Senior post, experience of inventory and distribution systems is desirable.

Operations Analyst c. £4,600. To be part of the Operations Planning Group, handling computer evaluation studies and providing an information and planning service for the day to day running of computer operations. Applicants should have thorough ICL experience on one or more of the following: GEORGE 3 OPERATING SYSTEM, COBOL PROGRAMMING, OPERATIONS ANALYSIS.

Systems Analyst and Systems Designers c. £4,600. For both production and commercial projects. A minimum of two years in a D.P. discipline, provided they display the necessary motivation and temperament. Designers should have good programming experience.

Systems Analyst. To work in the above areas. Currently earning over £3,500.

An excellent range of fringe benefits includes generous assistance with relocation for an application form, please write or telephone.

Terry Brown, Personnel Manager, Quinlan Hazell Ltd, Colwyn Bay, North Wales
Tel: Colwyn Bay 44261.



AUSTRALIA EDP MARKETING OPPORTUNITIES £16,300-£22,700

Dattec is Australia's largest and oldest independent software house specialising in customised computer applications.

In 11 years of operation we have grown to some 110 professional staff in Sydney, Melbourne, Brisbane, Canberra, Perth and Adelaide.

Six Marketing Positions

1. Corporate Marketing Manager - New products and services to identify, research and introduce new products and services to this Computer Services Organisation. This is a senior appointment reporting to the Managing Director, and applicants should have experience in the following areas:
- Hardware or Software sales
- Market Research
- Public Relations and Advertising
Location, Sydney.

2. N.S.W. Sales Manager
Although customised computer consultancy is well developed in Australia, contract work as it is practised in the UK is in its early stages. We are specifically looking for an experienced professional in the people contracting field. The right person is currently holding a senior management or sales position with one of the top UK software/people contracting companies.

3. Software Products Sales Manager
This job involves a number of software products, including commercial applications, databases and general purpose systems. We wish to recruit an experienced software product salesman to sell and support these products. He will be supported by a software products group and by our consulting division. The successful applicant will have had extensive experience in selling commercial application packages and will be able to demonstrate a successful track record in negotiating, closing and quota performance. A successful MARK IV salesman would be of particular interest. Sydney or Melbourne.

4. Small Computer Systems Division - Commercial Sales Manager
To obtain new business in the area of commercial systems design, programming, consulting and OEM sales on minicomputers, Sydney or Melbourne.

5. Small Computer Systems Division - H/W - S/W Packages
Dattec has developed a number of highly successful commercial systems on minicomputers. There is currently a vacancy for a salesman to manage the packaging of these systems and to sell the total system (H/W and S/W) to other organisations in the same industry. Sydney or Melbourne.

6. Perth Branch - Sales Manager
This position is second-in-charge to the Perth Branch Manager and is responsible for obtaining new business in the areas of consulting, contract systems and programming, and minicomputer turnkey contracts, etc.

Our founder and Managing Director will be visiting London to interview prospective candidates. Enquiries from Australians interested in returning home are also welcome. Send a brief resume (including a day and evening phone No.) to Mr. H. Douglas C/o Bartlett Jeffries Advertising Ltd, 23/25 Fleet Street, London EC4A 3NE, to arrive by November 7th.

Dattec
Dattec Pty. Ltd.
220 George Street,
SYDNEY N.S.W. 2000
AUSTRALIA

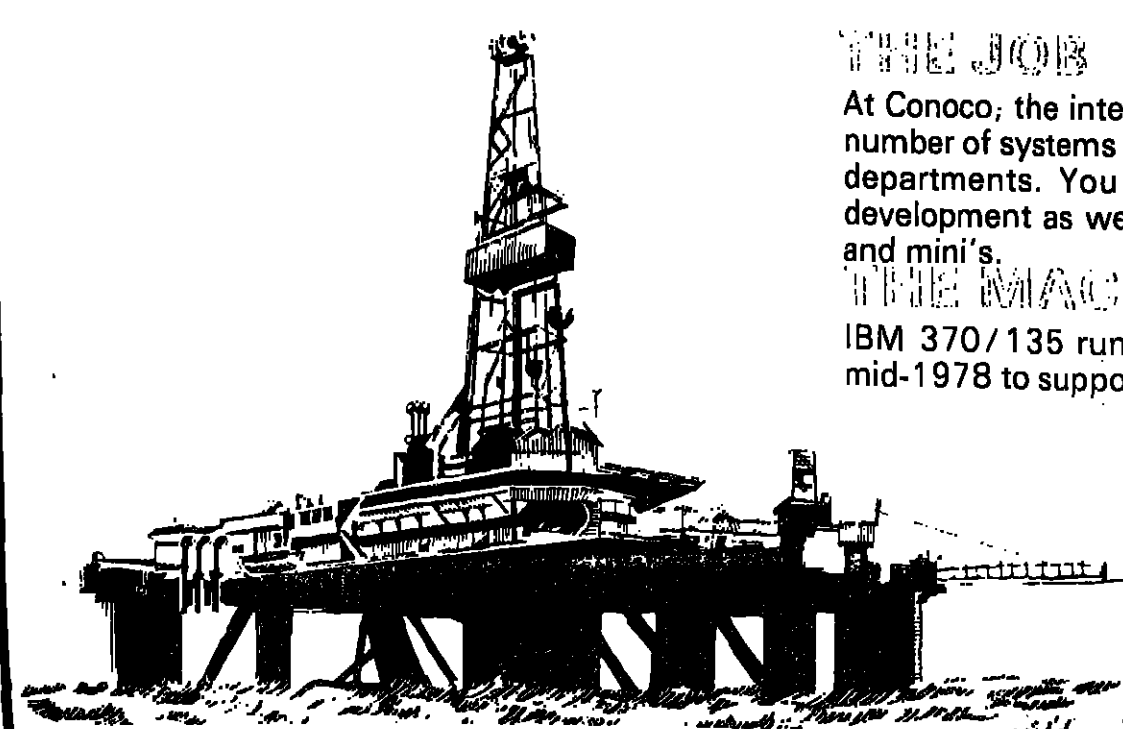
Computer Personnel International

COMPUTER WEEKLY, October 20, 1977

35

110 St. Martin's Lane, London WC2N 4BH
Telephone: 01-836 6775

DOGS (VS)
INSTANT SUPPORT
£6,000-£10,000
LONDON W.1



THE JOB

At Conoco, the international oil and energy group, we have vacancies for a number of systems programmers, in our expanding Computer and Software departments. You will be involved in technical support and software development as well as software and hardware evaluation on mainframes and mini's.

THE MACHINE

IBM 370/135 running under DOS/VS. This system will be upgraded in mid-1978 to support teleprocessing real-time applications.

YOUR REQUIREMENTS

If you have two years' experience of IBM systems and Assembler programming and want to get involved in advanced computer technology, call our software specialist: Ciaran McGlone on 01-493 1235, ext. 3486 or write to him at: Continental Oil Co. Ltd., Continental House, London Data Centre, 105 Wigmore Street, London, W.1.

conoco

ARBAT

Systems Programmers

Central London c£5 1/2k

To reconfigure and install operating systems software to meet special requirements and to develop and install SWIFT Interface utilities and special communications facilities.

Assembler level experience is essential, ideally with a knowledge of TP or message switching.

ARBAT will give comprehensive training on their DEC PDP-11 in-house equipment plus usual company benefits.

For further information please telephone Jenny Dalrymple-Hay on 01-493 2947 (Beeconsfield (04946) 4579 evenings and weekends) or David Lawton on 01-248 6499 (04862 61091 evenings and weekends) or write to 160 Queen Victoria Street, London EC4V 4DA.

THE UNIVERSITY OF SHEFFIELD
UNIVERSITY COMPUTING
SERVICES

DEPUTY DIRECTOR

Grade 6b £6453-£7081 a year

Applicants are invited to apply for the above post as soon as possible. The post is divided into three main areas: Systems Development, Operations and Systems Support. The successful applicant will be responsible for the Operations and Systems Development areas. Applicants should have both managerial and technical experience. Salary will be as quoted above plus pension.

Candidates must be registered and qualified in the above post by 11 November, 1977.
Applications to: Mr. J. ANGELL, PERSONNEL MANAGER,
P. W. WOOLWORTH & CO. LTD.,
PARADAY ROAD,
BIRMINGHAM INDUSTRIAL ESTATE,
BIRMINGHAM B15 2JG.

COMPUTER ROOM SUPERVISOR

Applications are invited for the position of Computer Room Supervisor at our Head Office, sited on Marylebone Road, London.

The successful applicant, who must have at least two years' relevant experience, must be capable of taking full responsibility for all aspects of this operation.

Systems currently processed on our main frame computers via an RJE terminal are in the process of conversion, to be run on a recently installed C.A.I. SYFA mini computer, with implementation scheduled for early 1978. At present only one shift is worked, although it is anticipated that this may be extended.

The position offers a good working environment, together with the normal range of large company fringe benefits. Salary is negotiable dependent on experience.

Applications to: Mr. J. ANGELL, PERSONNEL MANAGER,
P. W. WOOLWORTH & CO. LTD.,
PARADAY ROAD,
BIRMINGHAM INDUSTRIAL ESTATE,
BIRMINGHAM B15 2JG.

ata Computer Recruitment

A division of ATA Selection and Management Services, recruitment consultants to industry and commerce since 1962.

SERVICE ENGINEER GLASGOW/EDINBURGH c£6250 + CAR

Datagraphix, a subsidiary of General Dynamics, require an experienced computer/electronics engineer to service their COM installations in Central Scotland. Applicants must have the ability to work independently and maintain maximum utilisation of the equipment for customers. Salary is made up of a basic to £4,250 + car, stand-by allowance of over £2k, overtime, telephone, meal allowance + other large company benefits. Telephone 031-226 5381 or forward details to ATA Computer Recruitment, Anglia House, 26 Frederick Street, Edinburgh.

MIDLANDS OPPORTUNITIES SYSTEMS ANALYST Kidderminster c£4500

for project work on general commercial systems, a minimum of 18 months' experience in COBOL/ASSEMBLER required. 'A' levels preferred.

PROGRAMMERS Birmingham to £4000

required for mini + mainframe installations, with a minimum of 12 months' experience of any of the following ASSEMBLER, PL1, CICS, Machine Code. Also JUNIOR PROGRAMMER c£3k, preferably Graduate.

PROGRAMMER Droitwich c£4000

Aged 20/30 for Honeywell series 60 installation, COBOL essential, ASSEMBLER useful.

OPERATORS Solihull c£4000 inc.

Must have experience of ICL 1903/1908, both batch and on-line, operating 3 shift system. Applications are both technical and commercial.

For details of these and many other Midlands opportunities contact 021-643 1994, ATA Computer Recruitment, Woolworth Building, 102 New Street, Birmingham.

LONDON (01) 637 0781 MANCHESTER (061) 832 5857 BIRMINGHAM (021) 643 1994 BRISTOL (0272) 211035 EDINBURGH (031) 226 5381 GLANWYLL (0293) 514071

So far no life

PROGRESS INTO SALES WITH BURROUGHS EXCELLENT SALARY + BONUSES + COMPANY CAR LONDON/BRISTOL/SOUTHAMPTON

Burroughs, best known for computer hardware and software, are leaders in this field of technology.

Burroughs UK is the largest member of the International Group

Sustained expansion and continuous internal promotion has created a need for new members of the sales teams.

You must be self-motivated, ambitious and capable of adjusting to the personal and intellectual demands of a rapid career progression. Self-assurance is essential as you will be negotiating with senior executives and handling selected accounts including the UK's most prestigious companies.

A programme of intensive and on-going training will provide you with the professional skills to express yourself through personal effort and the determination to succeed.

If you have a degree or equivalent with a systems or sales background, but find yourself not realising your full potential in your current employment, then you and Burroughs could achieve success together. Ring now for an initial interview or write to Caroline Bagley

Ref: CB 8000.

PROGRAMMERS AND ANALYSTS ARE INVITED TO JOIN US FOR WINE AND CHEESE ON MONDAY, 24th OCTOBER, 1977 5 p.m. - 8 p.m. AT VLI HOUSE

A major communications company wish to recruit analysts and programmers to design and develop mini based systems.

Candidates are likely to have experience of mini programming and could have progressed to analysis more recently.

The opportunity is available to join small project teams working on advanced systems for external users. A positive career path will be demonstrated by candidates prepared to back their ambitions with flair and application.

Members of the management team have agreed to attend informal discussions at our offices and suitable candidates are invited to attend.

Directions: Closest Underground Leicester Square, use Cranbourn Street exit, walk to end of Cranbourn Street (30 yards). VLI House situated opposite to the right

CAREER DEVELOPMENT IN SYSTEMS PROGRAMMING SURREY UP TO £4500 + BENEFITS

ARE YOU already a Systems Programmer wanting new challenges and more responsibility?

OR HAVE YOU 6-24 months general computing experience and ambitions to move into software and data base work?

This medium sized company has large scale computing plans, and needs people like you, with a degree or good A levels, to keep up the pace of new developments. A 370/158 with VS1 and IMS already supports one of the most sophisticated on-line data base systems in the country, and you will be offered excellent training and career opportunities as a member of this highly professional team.

In addition to a good basic salary there are significant fringe benefits (such as free lunches, bonus and mortgage scheme), flexible working hours in a pleasant semi-rural location, and good sports and social facilities.

SIR 3000.

PROGRAM IN DELIGHTFUL SUSSEX SALARY—£ EXCELLENT

You will find more opportunity computer programming in pleasant CROWBOROUGH, Sussex, with Taylor Analytics a leader in the design, development and manufacture of equipment for oxygen analysis and gas chromatography.

The company has embarked on a planned steady expansion programme to expand this specialised field, and as part of this expansion now require a PROGRAMMER with 1-2 years' COBOL experience, ideally from a commercial/manufacturing environment.

Taylor Analytics offer SECURITY, prospects of PROMOTION, and BONUS based on company profitability, in addition to an EXCELLENT SALARY.

Ref: KS 8036.

PROCESS CONTROL IN BEDFORDSHIRE MINI ASSEMBLER To £5000

Join a hardworking, expanding D.P. team and be part of an international manufacturing organisation using PDP 11 equipment.

If you have sound knowledge of Mini Assembler, this job of Programmer/Analyst could be the position you have been looking for. Ideally, you will have gained your experience in a process or production control environment although general manufacturing knowledge would certainly qualify.

If you are ambitious, competent and keen to become actively involved in client liaison and systems implementation, don't hesitate to apply now.

Ref: AH 2010.

IBM COBOL PROGRAMMER-SENIOR PROGRAMMER HANTS/SURREY/SUSSEX BORDER to £5300

Our client is located on the outskirts of Guildford in Godalming.

This is an opportunity for an experienced programmer to become an integral member of a small, friendly team, utilizing sophisticated systems in an on line environment. The company's current installation is an IBM 370/135 although upgrading is scheduled in the not too distant future.

You should be self-motivated and capable of working with the minimum of supervision. IBM COBOL experience is essential although candidates with knowledge of Assembler or RPG II would be of particular interest. In addition to career advancement our client also offers excellent remuneration and company benefits.

Ref: CB 4040.

MINI PROGRAMMERS LONDON Up to £5500

One of the leading systems houses in the U.K., now wishes to recruit a number of experienced programmers to participate in their latest development projects.

Initially you will be directly involved in specific assignments with DEC, Ventek and Data General based Systems.

Experience of Basic, Cobol, Databas and Assembler in an industrial or commercial environment is essential.

The company offers a substantial career path in the consultancy area of D.P. and ambitious programming professionals will find the scope they need for advancement.

Ref: DG 1000.

ARE YOU PREPARED TO BE SECURITY CONSCIOUS AND TRAVEL? c £5000 + Mortgage + Benefits

Programmers are required to join a leading bank in London to become part of the EDP Auditing Department. The main function of the successful candidate will be to produce software to monitor the Bank's many and varied computer systems both in London and throughout Europe, the Middle East and Africa.

Candidates should be of a mature disposition, and should have the ability to programme, using Cobol. They will be required to travel abroad for about 25% of the year, and their domestic lives should not make this impossible.

This is an unusual opportunity to enter the financial world at a responsible level with ample opportunity for career development. A subsidised mortgage could be made available on top of a non-contributory pension scheme, low interest loans and a generous travel allowance.

Ref: AH 2710.

SHIFT LEADER MIDDX/W. LON. CIRCA £4800 + O/T

The Subsidiary of a large European company which is situated in West London, has a requirement for a Shift Leader.

Candidates should ideally possess 4 years 370/OS experience coupled with good knowledge of OS/VS1 and its related J.C.L. Knowledge of DOS would also be an asset.

Benefits are in line with most international companies.

Ref: NA 6892.

ICL OPERATOR WITH DESIRE TO EXPAND SOFTWARE KNOWLEDGE NO SHIFTS c£3500

The successful applicant for this challenging post will have 2 years' ICL GEORGE II operating experience with a good knowledge of macro files.

The position will appeal to someone who would like to do less operating in order to be given substantial responsibility in Data Control plus the opportunity to LEARN and APPLY FILETAB.

Candidates from either sex would be welcome, although this is currently a predominantly female installation.

Ref: KS 5125

OPERATIONS WITH A DIFFERENCE

Are you interested in progress? Then you have no option but to read on!

Our client has an installation comprising two complex 370 Machines with a unique software spooling system.

They require young operators with good knowledge of 370/OS to assist in enhancing their installation.

Salary would range between £3100-£3400, and benefits would be in line with large international companies.

Ref: NA 6052

COMPUTER CENTRE MANAGEMENT FILE CONTROLLER EDINBURGH £5,000

This prestigious group of companies based in Scotland is fully committed to the continuing advancement of their computing techniques. To this end they are currently installing a central Honeywell Level 68/20 facility to be utilised for online data-base and batch systems.

A first-class opportunity exists for a responsible person to take a senior role as File Controller in the computer operations department.

The job involves responsibility for the day-to-day control and administration of all aspects of file allocation and data security. Additionally, the long-term planning of data management strategy will necessitate close liaison with the system development teams.

Training will be provided and career prospects are excellent. Company benefits include non-contributory pension scheme and 4 weeks holiday. Relocation assistance is available.

Ref: KS 700

Interviews in Edinburgh, Manchester and London

DOS/VS POWER/VS ESSEX

If being domiciled in Essex and working in London is becoming tedious, this might be the opportunity you have been waiting for.

Our Client, an International Manufacturer, is currently looking for an operator with 12 months 370/125 experience.

If the idea of promotion into Programming or Systems analysis appeals to you, coupled with a salary around £3700 and additional benefits this could be the ideal post.

Ref: NA 5304

ICL OPERATOR £3,600 N. LONDON

A minimum of 1 year's experience on ICL 1900 range of equipment could lead you to our client's modern computer centre where plans to run 2800 large range computers are imminent.

You would become one of a team of operators making a worthwhile contribution to the continued success of this important expansion programme.

Big company benefits exist.

Ref: KS 6094.

SOUTH LONDON DOS/VS

Operators with 12 months DOS/VS experience, there is an opportunity in a large financial organisation for you.

If you are ambitious, fast promotion within operations or progression into Programming or Systems is obtainable.

Starting salaries are negotiable between £3700-£4200, also a benefits package is available which includes a mortgage subsidy.

Ref: NA 5341.

JUNIOR OPERATOR 2 SHIFTS £2600 S.W. LONDON

Perhaps to date your introduction to Data Processing has been limited to some Terminal Operating, and you now feel it is time to make the step into a MAINFRAME environment. Well, here's your opportunity to join a young UNIVAC 80/30 user.

— IT IS A COMPANY THAT'S RAPIDLY EXPANDING ITS BUSINESS SYSTEMS

— IT COULD BE YOUR NEXT EMPLOYER

Ref: KS 6095

SENIOR OPERATOR IBM OS/VS1 £4,500 + PERKS — CITY

An American bank who are currently moving into new areas of data processing, requires a senior operator with 4 yrs OS/VS1 experience preferably on IBM 370/145. Job control language and IBM utilities are essential, however a candidate with the right technical aptitude will be given all the necessary training needed. Promotion and progression into programming, banking or technical support is possible. Our client is also running two minis and training will be given in that area. Generous allowances are also given in-line with most banking environments.

Ref: NA 4378

SCOPE + CHALLENGE = STIMULUS FOR ICL SENIOR OPERATOR £4,100 MIDDX

Responsible for the effective operation of the computer and shift, this is an interesting opportunity to work in a lively and progressive medium-size bureau.

Candidates for this post must have achieved a good work record from a GEORGE II environment over the past 2-3 years, and have the proven ability of supervising a shift.

It is envisaged that the successful applicant will be no younger than 23.

Ref: KS 5385.

ICL OPERATOR c £3700 OVERTIME AVAILABLE N. LONDON

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Ref: KS 5881

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READING & LONDON

The following vacancies are with a software house with units based in Reading and London, as well as in the North West. Although most of the vacancies will be based in the South, candidates with 2900 experience could be considered for future vacancies in the North.

2900 SYSTEMS to £8,000

There are a number of vacancies for 2900 experienced staff at all levels for Applications and Software support programmers as well as systems analysts. All candidates must have a strong programming background and must be suited to work in a customer environment. We are equally interested in COBOL programmers and technical staff who have worked on software support and have experience of VME/8, VME/K or IDMS. Systems applicants must be able to study and define systems requirements for large 2900 Users in order to design special systems. This will include proposal writing and implementation. Senior candidates should have been involved on the successful implementation of at least one project from design to installation. Ref. 873/CW.

DP MANAGEMENT to £8,000

Candidates with technical experience in DP Management are invited to apply for DP Manager/Consultant positions. The assignments will be based in the U.K., at customers' sites and will offer a variety of hardware as well as applications. We are looking for experienced personnel who have actively been involved in setting up at least one installation and have preferably worked on more than one type of hardware, including IBM, Burroughs, Univac, and ICL mainframes. They will have had a mixed background in Systems Programming as well as possibly operating Ref. 874/CW.

To apply for any of the above positions or for further information, please telephone or write to Renee Nute and Sandy Lloyd on 01-342 5356. If it would be more convenient to telephone in the evening, the telephone numbers are: Renee Nute, 01-874 6372; Sandy Lloyd, 01-891 5168.



Computer Programmer

Bostrom Division of UOP Limited is the world's leading manufacturer of suspension seating for the truck, tractor and industrial equipment markets. We are currently seeking an experienced programmer to join our small but expanding D.P. Installation, which utilises an IBM System 3, Model 12. The successful applicant will have a minimum of three years' programming experience, using RPG II, and will probably have worked in a manufacturing environment. Commencing salary will be dependent upon age and experience, and the company offers a wide range of benefits, including 28 days' annual holiday and contributory pension scheme with free life assurance benefit. In first instance, please write or telephone for an application form to: Mrs. P. Cowgill, Personnel Officer, Bostrom Division, UOP Ltd., Weeden Road Industrial Estate, Northampton, Tel: (0604) 66621.

IMPERIAL COLLEGE POST-DOCTORAL RESEARCH ASSISTANT

required to study complexity and complexity change of large programmes. Research experience essential. Familiarity with ALGOL, Burroughs systems including MCP and Compilers, and Mathematical ability an advantage. Project has potential for fundamental breakthrough and requires initiative and innovative ability. Successful candidate will be based in London but much work will be carried out in large commercial organisation in Sheffield. Appointment initially for one year but renewable. Salary on Scale £3,805-£6,077 per annum plus superannuation. Apply to Professor M. M. Lehman, Department of Computing and Control, Imperial College of Science and Technology, London SW7 2BZ.

COMPUTER SYSTEMS TEST ENGINEERS

The Cable and Wireless Group is one of the leading telecommunications organizations in the world, embracing cable and radio systems, communications via satellite, telephone systems, computer and data handling. We are continuing to expand our activities in all areas of telecommunications, and require several Computer Systems Test Engineers to join our Development and Production Department. Responsibilities will include commissioning and system testing message switching systems using PDP8 mini-computers and Multiplex equipment manufactured in-house. Qualifications and experience should include HNC in electronics or equivalent, at least two years mini-computer experience, and systems design experience. Although not essential, some software programming experience would be an asset. We offer excellent commencing salaries, and generous benefits including leave and pension arrangements and flexible working hours. Please telephone or write for an application form to: Miss Christine Morgan, Cable & Wireless Limited, 114 Great Suffolk Street, London SE1 0SG. Tel: 01-828 1901 ext. 236.



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Miss Sandra Beesley, Manager, Recruitment and Selection



CONTROL DATA AUSTRALIA PTY. LIMITED
598 St. Kilda Road, Melbourne, 3004. Telephone: (03) 51 0351.

CONTROL DATA

404 3011

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24.5K ELECTRONIC ENGRS. W. Drayton
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CITY OF BIRMINGHAM POLYTECHNIC
The following vacancies exist in the Computer Centre which operates on ICL 1902S (32K) running under GEORGE 2 and MAXIMOP.
SYSTEMS ANALYST £4239 to £4545 + £312 + 5% (Max. £208) Supplement
A person with substantial data processing experience is required. A good knowledge of programming is essential and experience in an educational environment desirable.
CHIEF PROGRAMMER £3825 to £4095 + £312 + 5% (max. £208) Supplement
Required for Systems Analysis, Programming, etc. Applicants should have a high degree of motivation, ability to work with the minimum of supervision, and be capable of supervising a small programming team. Salary range £4239 + salary + £4095 + £312 + 5% (max. £208) supplement.
Further particulars and application forms (to be returned by 4th November, 1977) from:
The Personnel Officer
City of Birmingham Polytechnic
F Block, Perry Barr
Birmingham B42 2SU
Tel. 021-358 5911, Ext. 217

LIVERPOOL AREA HEALTH AUTHORITY (TEACHING)
Liaison Officer
Experimental Computer Project
Salary: £4,528-£5,603 per annum (Scale 9) inclusive of earning supplements
The basic function of this post is to form a communication bridge between the computer team and the staff concerned with the day-to-day management of health service functions and activities affected by the computer system.
The post offers valuable experience in both hospital management and information systems context and will be an appropriate post for career development in hospital management.
Applicants should have wide experience in hospital management and also a knowledge of computer systems. Appropriate training will be provided.
Application forms and job description are available from the Area Personnel Department, Ormeau House, Edinburg Street, Liverpool L3 5NG; telephone 227 4011, extension 34. Closing date: 4th November, 1977.

Systems Programmer (IBM 370/145)
AP3/4/5 - £3,234 rising to £4,407 plus Phase 2 supplement
This position is second in a team of 3 responsible for implementing and maintaining a variety of IBM and associated operating software. The present 370/145 is to be replaced by a 370/148 late next year running under OS/VSE. A network runs under CRIE and another under CICS-CMC. Reality systems are planned early in 1978. In three district councils which will operate online to the mainframe under RES. Applicants must have a sound knowledge of OS/VSE, JCL and BAL with a minimum of 3 years' experience. Persons with suitable previous experience may be appointed at a salary other than the minimum.
Assistance will be given with removal expenses in accordance with the council's scheme.
Application forms available from: The County Treasurer, PO Box 2, County Offices, MATLOCK, Derbyshire, DE4 3AH.
Closing date: November 11th, 1977.



Home Counties

Our client is a well established and dynamic company with a particular interest in specialists who can contribute to the growth of a department which already has an excellent reputation in the field of Operating Systems on ICL mainframes. They are looking for people whose long term career objective is in the field of large Operating Systems and have already had experience in programming/supporting one of the following:- GEORGE 3, VME/8, VME/K.

Excellent training will be given on 2900 facilities where necessary and successful applicants will be expected to assist with new developments, implement complete systems, analyse performance and tune the operating systems as well as to provide consultancy service to computer users, management and staff.

Senior Operating Systems Consultant £6500-£8500

Operating Systems Consultant £5500-£7500

There are plenty of opportunities to travel both in the U.K. and overseas. An assistance with relocation will be given where appropriate. Ring Stella Mitchell immediately for discussions.

CW42/1 KINGSTON

COBOL Programmers in the West End

One of the most interesting and rewarding openings for mainframe programmers in recent years has arisen. A major international company is on the threshold of a five-year development programme and wishes to recruit the first phase of its programming intake. Already an existing IBM user, they will have to upgrade their 370 to cope with their Data base, Real time, and Distributed Processing systems development. This ground floor opportunity is open to applicants with a proven record of Cobol programming on any machine. Successful candidates will enjoy the benefits of working for a company which include a competitive salary, technical training, career progression into analysis and management in addition to probable overseas travel. To secure an interview, please telephone 01-499 9214 and speak to Clive Hartrup.

Kingston: 44 Wood Street, Kingston upon Thames, Surrey. Telephone 01-549 3212 (24hrs) Telex 27960
Mayfair: 5-6 Yarmouth Place, Brick Street, London W1Y 7DW. Telephone 01-499 9214 Telex 27950
Dublin: Canberra House, 24 Lower Leeson Street, Dublin 2. Telephone 762170/762188/765892 Telex 30742
Amsterdam: Rijnvisdijk, Amsteldijk 166, Amsterdam 1010. Telephone 461844 Telex 11336

CW42/3 MAYFAIR

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Ring Gerald Delamere

CW42/2 DUBLIN

Future Systems Programmers

A team of highly technical PROGRAMMERS and CONSULTANTS is currently being sought by a large and very progressive software house. The work will stretch right across the board from development of micro based software, compilers to interactive distributive processing software and message switching to advanced applications on a variety of machines.

Programmers £5000-£6000

This is a rare opportunity for PROGRAMMERS and DESIGNERS with experience of any of the above fields who have also had at least one years' assembler experience to join at the very early stages of development and be involved with the initial design plans. ENGINEERS with micro processing background will also be considered.

Consultants £6000-£7000

CONSULTANTS who are still highly technical and have had experience with more than one range of machines, minis, or communications are urgently required. Unique opportunities also exist in an advanced micro processor-linked project. Relocation expenses will be met where it is necessary to move to Berkshire. The company offers attractive terms, conditions and individual career prospects as well as possibilities for overseas travel. Please ring Stella Mitchell for a confidential discussion.

CW42/4 KINGSTON

PL/I or COBOL PROGRAMMERS

£4,500 - £6,000

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Examples of our current projects are:

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- the investigation of on-line programming techniques

Our major production systems are run in batch mode and are written in PL/I. We are, however, carefully introducing new on-line systems as the business requirements change to enable us to provide a complete service to our users.

Our installation consists of an IBM 370/145 and a 370/148 is to be added in November.

We are looking for four young highly competent programmers who:

- have 2+ years sound commercial background
- are strongly motivated to succeed and to meet difficult targets
- are willing, if necessary, to retrain in PL/I

Hambro Life is a vigorous, growth company, heavily dependent on computer systems, and provides the opportunities for career development to be in line with individual achievement. Progress within the Company is purely dependent on ability and salaries extend to £7000 for programmers who prove their effectiveness.

Fringe benefits include a generous disturbance allowance, relocation expenses to rural Wiltshire, free life assurance, non-contributory pension scheme, free membership of BUPA and a share option scheme.

For our comprehensive booklet contact

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SYSTEMS STAFF

1. A SENIOR ANALYST is required to be responsible for our manufacturing systems. Previous experience in on-line processing is desirable, but experience in a manufacturing environment is essential.
2. A number of support SYSTEMS ANALYSTS to work either in the manufacturing areas, or on financial systems also needed.

Applicants must be self motivated and capable of taking the responsibility for a particular application.

PROGRAMMING STAFF

3. A CHIEF PROGRAMMER is required to supervise and lead a small team of programmers. Experience of teleprocessing is highly desirable.
4. Vacancies also exist for programmers at different levels. One position will be of interest to a person with expertise in NEAT-3. Preference will be given to candidates with expertise in COBOL, TPS and Applications Manager. Salary will be in accordance with experience and position. Assistance with relocation expenses will be given where appropriate.

Write or telephone for an application form to:

Staff Personnel Officer
Abercynon (0443) 740331

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RW 42/1

PROGRAMMER/ANALYST

\$20,000+

Brussels
A minimum of three years' experience, preferably in NEAT/3 on NCR equipment, could qualify you for this exceptional career opportunity. Banking experience is not mandatory.

RW 42/2

These positions exist within one of the world's leading banks. The career opportunities within the important and vital Internal Audit function reflect the rapid growth of this eminent organisation.

ARE YOU INTERESTED IN ORIGINAL SOFTWARE DEVELOPMENT?

A series of development projects on **COMPILERS, DBMS and TRANSACTION PROCESSING SYSTEMS**, are currently being undertaken by the software development group of this major manufacturer of mini computers. Based just outside London, this small group has total company-wide design and development responsibility for these projects.

If you are young (less than 30), intelligent, and enjoy creative programming (or even are bored with applications work), then these positions offer an unusually stimulating environment. The working surroundings are especially pleasant. Facilities include three systems dedicated to on-line program development. You will probably have some programming experience in a low-level language, real-time environment; you might well have a Computer Sciences academic background.

Above all, you will be attracted by the opportunity to create, develop and implement your own ideas in these important areas of software technology. Normal big company benefits include salaries in the range:

£4000 + £6500

RW 42/3

PROGRAMMERS ANALYST/PROGRAMMERS

Up to £7000

SMALL BUSINESS SYSTEMS IMPLEMENTATIONS

IBM SYSTEM/3, SYSTEM/32, SYSTEM/34 ICL 2903/4

A major British software house is expanding its business in the area of small business systems implementation and software. This is a rapidly expanding area of business, and the company's continued growth will be constrained only by their ability to undertake and staff projects with high calibre personnel.

As a result, the company now wishes to recruit staff for their Small Business Systems Division. They will support commercial clients who plan to implement small mainframe computers for general business applications, using RPGII and COBOL as the main programming languages. Analyst/Programmers are responsible for systems design for the client, and prepare detailed programming specifications. They are expected to ensure the successful completion of projects to the client's entire satisfaction and according to agreed timescales. They will also supervise Programmers on clients' projects.

The company is one of the leading UK systems houses, established nearly ten years ago. It is backed by a substantial industrial organisation and is therefore well placed to take advantage of an expanding market. Most of its work has been UK based but it is now looking for a growing proportion of its work to come from Western Europe.

Candidates who have not worked with RPGII or COBOL, but who otherwise meet the requirements of the job should not be deterred from applying as training can be provided.

This is an excellent environment in which to develop your creative abilities and to make a meaningful contribution to the furtherance of your own career.

Please telephone Tony Baker on 01-499 4501 during business hours or 01-445 3512 at other times to discuss without commitment these opportunities.

RW 42/4

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WORK CONTENT →	The mainframe division of the company provides support services to computer users. Our services include time and materials programming and analysis, fixed price projects, consultancy and facilities management. Our client base is taken from many different business sectors and includes some of the largest companies in the UK. Other divisions in the company are involved in turnkey mini systems and data preparation.	As the sales division grows, so too does the need for more systems and programming staff, both permanent and subcontract. You will liaise with sales staff to identify future needs. You will help out on advertising, interviewing and selecting staff to match requirements generated by sales staff. This may be your first step out of technical DP work or the opportunity for you to consolidate your DP experience in a personnel role.
CONTACT →	Anne Truelove at 01-734 5351 or CHESHAM (02405) 74181, or use our answering machine if you ring out of office hours. Or send details to:	Anne Truelove at 01-734 5351 or CHESHAM (02405) 74181, or use our answering machine if you ring out of office hours. Or send details to:

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- a practical, business minded outlook and an interest in (or experience of) analysis work
- the ability to accept responsibility, work with little supervision and use initiative.

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EDP Systems
52-53 Margaret Street
London W1N 7FF
Tel: 01-637 5796

H.P.S.L. H.P.S.L. H.P.S.L.

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THAMES VALLEY AREA

Our client who is a well established International Publishing Company is shortly to upgrade from a Honeywell 2020 to a Honeywell 6240. A full system revision is planned to take advantage of the facilities available on the new equipment.

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To discuss the above vacancy please telephone Joan Lovejoy on Amersham (02493) 22201.

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Applicants will be invited to look through our client register which details the companies, positions, salaries, prospects, etc. so that we may jointly choose the vacancies best suited to your requirements and experience.

For more information ring:
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to work on two S.V. funded projects concerned with fleet planning for container ships and with container unit utilisation and cost functions. Candidates should be academically qualified. Familiarity with computers, knowledge of or techniques, and transport experience will be regarded favourably.

The posts are as follows:
Two Research Assistants financed for up to one year. One Senior Research Assistant financed for up to two years. One Senior Research Assistant financed for up to three years.

The initial salary for the posts of Research Assistant will be within the range £2,504-£3,133 per annum and the initial salary for the posts of Senior Research Assistant (successful candidates for which will be at post doctoral standard) will be within the range £3,333-£3,761 per annum.

Applications together with the names of two referees, should be received not later than 10th November, 1977 by the Registrar, The University, P.O. Box 147, Liverpool L69 3BX, from whom further particulars may be obtained. Quoted ref. BV/588/CV.

Cummins

Cummins Daventry is an expanding subsidiary of the American based Cummins Engine Company Inc. The company employs over 20,000 people worldwide, and the Daventry Plant is engaged in the manufacture of large diesel engines in the 900-1600 horsepower range. The plant has the following vacancy:

SYSTEMS ANALYST

The Department needs someone with experience and an interest in the user end of systems—investigation, presentation and implementation—and also with programming ability in either Cobol or PL/1. A background of manufacturing systems applications would be an advantage.

The company is in the forefront of technical systems development. For instance, the Systems Department utilises:

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- IMS Database
- On-line Applications
- Multiple Systems Coupling

FOR THIS POSITION WE ARE OFFERING AN EXCELLENT SALARY AND CONDITIONS OF EMPLOYMENT. WE CAN ALSO OFFER GENEROUS RELOCATION ASSISTANCE.

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Daventry, Northants NN11 5NU
Telephone: Daventry 4400; extension 207

Are you looking after No.1?

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With its variable storage capacity, processing speeds, and peripheral combinations, Series/I can be compared to a collection of building blocks. You simply select the best configuration to meet the customer's needs.

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realise that potential. If you have practical experience in four of the following areas, we'd like to hear from you:

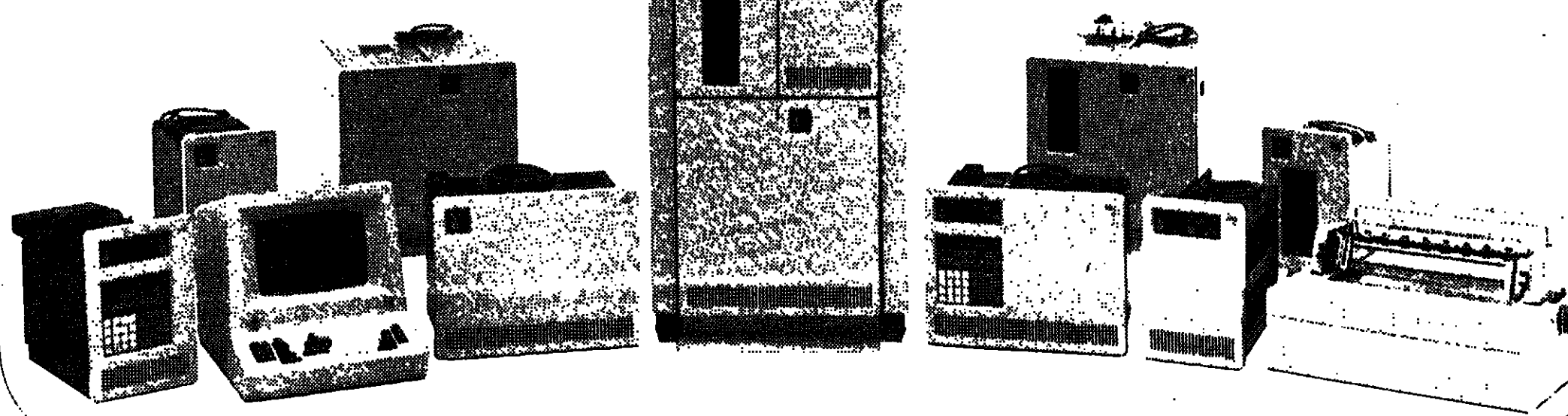
- Small computer applications development
- High-level languages—PL/I, Cobol, Fortran
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We'll back your understanding of small computer applications and DP sales operations with continual training, designed to give you all the confidence necessary to propose and implement effective solutions to customers' requirements.

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We have opportunities in most parts of the country, so please write with full career details to: Mike Porter, IBM United Kingdom Limited, 40, Basinghall St., London EC2, quoting ref:

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ON-LINE SYSTEMS DATABASE DEVELOPMENT
WEST LONDON

Further development within our client's data processing centre has created two openings for well motivated Cobol programmers to assist with the development of new ON-LINE systems and DATABASE development. Although systems are disk based on Univac hardware, experience gained on IBM or other leading hardware will be given serious consideration.

Our client is a well-known international organisation mainly concerned with the production and marketing of industrial and agricultural equipment. The two appointments advertised are a realistic opportunity to develop and broaden one's current achievements within a friendly and forward thinking company. For further details please quote CW 180.

ICL OPERATORS G2 and G2+ HOME COUNTIES (WEST)

£3,900 rising to £4,300 after one year

Here is an opportunity to join a leading international organisation whose products are brand leaders in the power tool market.

Currently they require additional operations personnel with at least 18 months' experience of G2 or G2+. Systems are based on an ICL 1903T running under G2+ with on-line facilities.

The D.P. Centre is spacious and well planned, with an excellent working atmosphere. The company operates a policy of internal promotion. Other benefits include four weeks' annual holiday, a subsidised restaurant and generous discount on company products. For further details please quote CW 161.

SYSTEMS ANALYST PROJECT LEADER
SURREY c. £5,000

We are recruiting on behalf of a large independent public organisation who operate as financial, professional and commercial agent for overseas government and public authorities.

ANALYST. Candidates should have sound experience in SYSTEMS ANALYSIS along with four years' programming encompassing on-line systems. A knowledge of Honeywell equipment would be advantageous.

PROJECT LEADER. Candidates' experience should be similar to that of the analyst appointment (paragraph above), coupled with management and leadership skills having a minimum of five years' overall data processing experience. Currently systems are Honeywell 1200 based progressing to a Honeywell level 68 next year. For further details please quote CW 182.

SENIOR PROGRAMMER
SALARY c. £6,000 p.a.
LONDON, SW1

A highly specialised consultancy is currently seeking an experienced senior programmer to assume total responsibility for the company's commercial programming activities.

The successful candidate should possess a sound knowledge of Cobol coupled with in-depth experience of the IBM DOS Operating System. An ability to deal with personnel at all levels is essential. Additional duties will include providing technical support to the operations team by means of both on-site visits, within the referenced land point.

This is a key position for someone with the right qualities whose background combines both staff and production, in keeping with the company's fine reputation for providing a good and efficient service. For further details please quote CW 183.

Edmund Howard & Partners
Computer Personnel Consultants
5 Brighton Road, Surbiton, Surrey, Telephone 0181 899 1885
58 Grafton Street, Dublin, Daphne, Tel. 01 274 2741

John's 1818

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Can you work entirely on your own or perhaps lead a project team? Our requirements are so many and varied in scope and manufacturing, and in the industries. We can offer long-term contracts to individuals with the ability to liaise with senior management, writing high level systems, and still appreciating the problems of implementation. Ideally on ICL, IBM and/or other large mainframe computers. It is important that you have the ability to program in COBOL or Fortran, though generally it would not be expected of you.

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You may require a variety of different environments, working with new jobs, or taking on the challenges that are constantly varying as a freelancer, or you may prefer the security of a permanent job with strong career potential and the invaluable training given in regular employment. Whichever your preference our files can offer you hundreds of opportunities to choose from, both in the UK and abroad. Register with us today by ringing for immediate action.

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We have contracts leading to permanent jobs particularly for those educated to 'A' level standard, ideally with some experience in data control or JCL (though not essential). Preference will also be given to those with some previous experience with OS/VS or EXEC 8.

SNR OPS — SHIFT LEADERS

£4-5K+

We have many vacancies for career minded operators who will be able to take on the junior management position. Ideally you will have a minimum of 2/3 years IBM DOS or perhaps ICL GEORGE background — but we can also assist operators with Honeywell, Univac or Burroughs experience.

Telephone us today on 439 3671 for an application form or to discuss your career prospects.

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computer services

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It stands to reason. If you've spent some years in data processing you know how to translate User requirements into effective applications. Well, NCR can use that valuable knowledge. In fact it is absolutely essential in selling computers today.

NCR is an international Company operating world-wide. With millions of pounds invested in computer development.

We produce one of the widest ranges of equipment. From standard terminals, VRC's and minicomputers to advanced mainframes. With sophisticated systems of great appeal in retailing, banking, commerce, industry and local government.

Your DP knowledge interfaced with our technical and sales/marketing know-how can represent great sales potential. We should exploit it together.

Provided you are confident and convincing in your approach to people, we'll channel your computer career into a more rewarding path. We'll teach you equipment technicalities and modern sales techniques and you could soon find yourself negotiating complete systems. Eventually, that could include mainframes like our latest Criterion series.

So don't just deplore the tedium of your job. If you want to be out-and-

Computer Specialists & Systems Analysts have great potential for DP sales. Agreed?

about in the more exciting world of DP sales — do something about it. Come and talk with us. Let us show you what we've done for others just like you. And how they started to earn real money by capitalising on their DP background.

We'll take a phone call or you can write for an early interview to: — H. J. Redington, Personnel Controller, NCR Limited, 206 Marylebone Road, London, NW1. Tel: 01-723 7070.

Real Time Software

For Programmers, Analyst/Programmers, Systems Analysts, Project Leaders.

SYSTEMS & APPLICATIONS	Data logging, telecontrol, supervisory control systems, monitoring and display, telemetry, plant control, etc.
MACHINES	Hewlett Packard 21MX, PDP11-04 to 45, Data General Nova, Intel 8080.
LANGUAGES	HP and DEC Assembler, Fortran, Coral 66, RTL 2, Macro 11, PAL 11, Basic.
PERIPHERALS	Colour VDU's chart recorders, data & telemetry links, mimic diagrams, plotters, loggers, etc.
OPERATING SYSTEMS	RSX11 M & D and in house specialist operating systems.
LOCATIONS	Chippenham, Wiltshire and Wokingham, Berkshire.

WESTINGHOUSE
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Generous relocation and removal assistance will be given where appropriate. For application form and/or further details please telephone or write to Mr. R. P. Lane, Personnel Officer on Chippenham (0249) 4141 extension 148.

PLAN Programmer

to be retrained for development work in **COBOL**

LONDON, W1 £5000 +

This is an excellent career opportunity for a PLAN Programmer to work initially on ICL 1900, and to be retrained in 1978 for COBOL development work on a major ICL 2900 configuration, using DATABASE (IDMS) and extensive REAL TIME applications. The installation is convenient for tube and bus services, and no travel on the job will be required.

This opening will interest programmers with upwards of two years' experience, including sound PLAN, COBOL and GEORGE 2 would be valuable, but are not essential.

We have been retained by clients to recruit for this appointment. For an initial confidential discussion, please ring us, quoting ref. 757. Messages will be recorded after hours.

Tel: 01-637 5796

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SYSTEMS ANALYST/SENIOR PROGRAMMER

£4900 - £6400

The Central Electricity Generating Board invites applications for the above position at its Computer Branch.

The Computer, a 192K I.C.L. 1903T is at Bournemouth, Stockport, but this job may take you on lengthy assignments elsewhere e.g. North Wales or North Lancashire. You will be part of the station liaison team providing a computing service to power stations, using both the ICL 1903T and their own equipment (Ferranti, G.E.C., D.E.C.). You should have had considerable experience of COBOL or FORTRAN, Operating Systems, Direct Data entry and enquiry systems and be capable of designing, specifying and implementing small systems.

A knowledge of real time logging and control applications would be an advantage.

Minimum qualification required — 'A' level Mathematics.

Applications in writing from either sex, giving details of age, experience, qualifications, etc., to the Personnel Manager, CENTRAL ELECTRICITY GENERATING BOARD, Europa House, 5th Floor, 100, Strand, London WC2R 2PH. Please quote reference number 339/2577.

MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

SENIOR ANALYSTS

S.E. HERTS £6000

Opportunities for Senior Systems Analysts have been created by an increase in new projects in an advanced installation using mainframes and minicomputers.

The company is involved in the use of Distributed Processing techniques and in the development of sophisticated systems using a Database and Teleprocessing facilities. The use of financial models is to be investigated. There is also a variety of commercial systems including Stock and Distribution applications. Future hardware and software requirements are being assessed.

Applicants should be able to offer sound systems analysis experience. Successful candidates will be given the opportunity to develop their skills, both of a technical and leadership nature.

The location is also very accessible from many areas of West Essex and North London. Terms of employment and fringe benefits are excellent.

PROGRAMMING STAFF

At least 2 years' experience

WEST LONDON IBM 370 OS

Senior c £5250
Systems c £5500

We are seeking capable PROGRAMMERS keen to enhance their career by a move to either a SENIOR or SYSTEMS PROGRAMMING role as a member of a newly formed team. The installation is implementing several new Systems with a development plan covering the next three years, including both communication network and database applications.

You are likely to have either sound applications experience using COBOL or, for the Systems Programming vacancy, a knowledge of IBM Software. An appreciation of manufacturing systems and an ability to communicate at all levels would be an advantage.

The salary and benefits package are commensurate with experience and will be in line with those given by a major International Company.

IBM SYSTEM 32 SPECIALIST

Permanent or Contract

CITY TO £6500

A London based financial organisation with branches throughout the world is seeking a person with in-depth knowledge of IBM System 32 issues.

The person appointed will play a major part in the development of branch systems, using a distributed network of System 32's, and can look forward to the opportunity of limited travel to countries in Europe.

Candidates must be experienced in the analysis and programming of applications on System 32's.

The Company is prepared to offer the successful candidate a permanent position within the Computer Department which offers excellent career prospects, or if preferred a twelve months contract can be established with the possibility of extension.

ANALYST

CITY c £5750

A systems analyst with sound experience in commercial systems design and an ability to progress towards project control is required to augment an active team in the City.

Candidates will be used to functioning in a team environment, working to good standards supported by comprehensive documentation. A background in programming would be an added advantage.

The successful applicant will be involved in unusual and interesting applications and will have the opportunity to establish good working relationships with user department personnel at both junior and senior level.

Conditions of employment are excellent, the company offer a comprehensive package of benefits.

Please telephone for a confidential discussion or write to:
30 Fleet Street London EC4Y 1AA
01-353 5868

Three open invitations to find out about the very latest software developments.

Liverpool

The Adelphi Hotel, Renshaw Place, Liverpool L3 5UL.
Wednesday October 26th, 12 noon to 8pm.

Radlett

The Red Lion Hotel, Watling Street, Radlett, Herts.
Wednesday November 2nd, 12 noon to 8pm.

Southsea

The Pendragon Hotel, Clarence Parade, Southsea.
Thursday November 3rd, 12 noon to 8pm.

REAL ALE

If someone asked you as a Software Specialist where the very latest software developments were happening, what would you say? With one of the big mainframe manufacturers? In some US research centre?

You'd probably be surprised to hear that the answer's at STL, the IIT Corporation's chief European research centre, a centre principally involved in the research and development of telecommunications.

And if you'd like to hear more about those software developments behind the communication systems of the future, now is a very good time to do it because some of the senior computer specialists from STL are travelling round the country to three venues in the next few weeks to meet Analysts and Programmers — and tell you at first hand about the exceptional career opportunities we have for men and women with a degree or equivalent and at least two years' experience in real-time programming, operating systems and technical DP or — for microprocessor work — knowledge of 8080s, high level languages and telecommunications systems. There are vacancies at several levels in these areas: **advanced computer aids for development of software associated with new products; design and layout for LSI chips and PCBs; circuit analysis and simulation; development of test languages; automatic generation of test sequences; and the new applications of microprocessors — real-time systems control, process control, software research.**

You'll also be able to see with the aid of an audio-visual presentation all the advantages there are in living and working in and around Harlow, an essentially rural area on the Herts/Essex border where housing is readily available and attractively priced, both in the town itself and in the villages which surround it. And London is near enough if you need it. The people you'll meet will be able to tell you all about it.

If it's not convenient to meet us on these dates, please write or telephone Vaughan Hartridge, Standard Telecommunication Laboratories Limited, London Road, Harlow, Essex CM17 9NA. Tel: Harlow 29531, extension 361.

STL

ANALYST/PROGRAMMER

Salary Circa £5,000

Company

Gainsborough Fabrics Ltd is a member of the international Carington Virella Textile Group engaged in the production of wool and knit fabrics for apparel and industrial and uses. It is situated in rural Suffolk and is the headquarters site of the Knitting Division.

Job

As our Computer operation is at present being redesigned a challenging opportunity exists for a person who has initiative and is adaptable to gain valuable experience in this phase of development. The applications of our operation are in the production, commercial and accountancy areas.

Person

Applications are invited from persons with a minimum of 'A' level education together with 3 years' Cobol experience and 2 years' Systems Design, preferably in an industrial environment.

Benefits

A salary, which is negotiable of circa £5,000 together with an attractive fringe benefits package offered and relocation expenses will be paid where appropriate.

Write or telephone for application form to: G. R. S. Bell, Personnel Manager, Gainsborough Fabrics Ltd, Radiator Road, Great Cornard, Sudbury Suffolk CO10 0HY

Gainsborough Fabrics

A Carrington Virella Company

TOP JOBS FOR TOP PEOPLE

SURVEY ANALYSIS MANAGER

The WEST END offices of a nationwide Bureau Operation has an immediate requirement for a professional person to take charge of a small department in Media and Market Research applications. The ideal applicant will be aged around 30 and possess a good systems and programming background, but will primarily be a first-class Manager. This position would probably be particularly suitable for someone who is currently DP Manager of a small mainframe installation and is looking for the opportunity to broaden their experience within a more sophisticated environment. A knowledge of IBM Equipment and FORTRAN would be a considerable advantage, as would some previous involvement with Market Research applications, but this is by no means essential.

to £6,000 p.a.

SENIOR ANALYST/PROJECT LEADER

A major consumer organisation with its DP Operation based in a pleasant area on the HERTS/ESSEX BORDER is currently looking for a Senior Systems Analyst to fulfill a Project Leader function. The successful person will have solid commercial analysis experience with a good knowledge of on-line or distributed processing investigation. He or she will be responsible for a team of analysts and programmers and will be expected to work largely on his own initiative.

to £6,500 p.a.

Opportunities also exist for JUNIOR ANALYSTS or ANALYST/PROGRAMMERS, wishing to progress into pure systems work. Salaries c. £4,500 p.a.

FLIGHT SIMULATION EXPERT FOR THE U.S.A.

If you have a minimum of 3 years' design and programming experience on engine simulation and flight systems with a solid grounding in PDP 11/45 ASSEMBLER, then this is your chance to see a bit of the world at someone else's expense. You will be based in the States for at least six months, with all expenses paid and a flat provided, after which, there will be an excellent position available in the U.K. should you desire.

£ Neg.

Starting salary for this one is negotiable and will pose no problem for the right person.

PROGRAMMING CONSULTANTS

A major Computer Services Company located on the BUCKS/HERTS BORDER has an urgent requirement for professional Programming Consultants with the following experience.

c. £6,500 p.a.

MINI COMPUTER SOFTWARE people with compiler writing experience, and MINI COMPUTER APPLICATIONS people with experience of FORTRAN, BASIC, etc., to work on DEC, Hewlett Packard and Data General machines operating on a turn-key basis with minimal travelling involved.

The same client would also be interested in hearing from people with 2 or more IBM languages and TP/DATABASE experience to work on client's premises in and around the LONDON AREA.

COBOL PROGRAMMERS — EVERYWHERE

If you are an experienced COBOL Programmer you have never been more in demand than you are at present.

to £5,500 p.a.

Here is a very small selection of the opportunities currently available:

E.C.2	2 yrs + ICL experience for 2903 installation
W.8	BURROUGHS COBOL — to learn Database techniques
MID ESSEX	2½ yrs. ICL experience — prospects to analysis
N.11	1 year + COBOL any hardware, for large R.T. System
SUSSEX COAST	18 months' + IBM OS experience
E.C.4	18 months' + any Cobol to learn IBM

Remember, this is only a SMALL selection, so if none of the above quite fit the bill for you give me a call anyway to see what else is going.

CONTRACT PROGRAMMERS

I urgently need people with the following experience for immediate starts.
PDP 11 MUMPS C. LONDON RPG II any machine HERTS
Ventek Mini W. LONDON H. COBOL OS 2000 W. LONDON
OS COBOL on-line banking experience ess.: NEW YORK
I also need 10 people with COBOL CICS and DL/1 to start January '78. C. LONDON.

to £200 per week

For further details of any of the above vacancies, or for information regarding other positions, phone SARAH SMITH

MARTON associates

FOR COMPUTER PEOPLE AT THE CROSSROADS
206/210 Bishopsgate, London EC2M 4NR
01-283 3237

ANALYST PROGRAMMERS

MANCHESTER

TOOTAL LIMITED is a large international group involved in all aspects of textile manufacturing and marketing.

The data Processing Department of Tootal provides a bureau service to the member companies of the Group, based on ICL 1903T and 1904A with a network of 80 terminals.

Further extensive systems involving Teleprocessing and Database are under development, and Analyst Programmers competent in Cobol are required to join existing project teams. A working knowledge of Plan will be an additional advantage. To fill these vacancies, candidates will need a minimum of three years' experience developing general D.P. applications.

Benefits include first-class technical training, a Group Pension Scheme, and flexible working hours. Salaries will be negotiated according to experience.

Please write giving details of age, experience and present salary to:

The Group Appointments Manager

TOOTAL LIMITED
56 Oxford Street, MANCHESTER M60 1HJ

CONTRACT PROGRAMMERS
LONDON
IBM 380 OS
COBOL
COMPLEX
(0234) 711717

Borough Treasurer's Department

Systems Programmer

S.O.1. £5,044-£5,350 p.a. inc.

We need an experienced programmer with the skill to recognise the areas of potential development within our computer systems, and the skill to carry them out. The successful applicant will be required to assist in the research and testing of new systems.

Knowledge of ICL PLAN and COBOL is essential. Working with a minimum of supervision you will be involved with GEORGE 2+, Radcon-Sascheck and ICL Dataview. Experience in these would be an advantage.

Application forms from Personnel Office, Town Hall, Forest Road, Waltham Forest, London E17 4AP (Tel. 01-481 8888 — 24-hour answering service).

Closing date: 4th November, 1977. Please quote ref. B.888

London Borough of
Waltham Forest

GRAMPIAN REGIONAL COUNCIL DEPARTMENT OF FINANCE COBOL PROGRAMMER

REF. 52777

Present ICL 1902 T to be replaced during 1978 by an ICL 1980 with 4 MB store, 5MB, 4 x EDS 200 and 2 x LP 1600
Salary scale A.P. Grades 11/111 - £3,098 to £3,825 per annum, with possible progression to £4,385 plus Phase 1 and Phase 2 supplements, with placing according to qualifications and experience.
Assistance may be given with removal and legal expenses in appropriate cases.

Application forms may be obtained from the Personnel Officer, Woodhill House, Ashgrove Road, West, Aberdeen AB9 2LU. Closing date for applications 31st October, 1977.

IBM & ICL OPS.
2 shift only
£3600 + p.a.
London

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(24 hours)
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Personnel Consultants

HIGH RATES
for freelance
R.P.G.
Programmers
Ring 01-930 3366

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Computer Centre
INFORMATION &
ADVISORY
OFFICER
£4236-6454 plus pay supplements of up to £250 p.a.
This is a senior post concerned with the full range of information services available to users of the Centre, involving documentation, training and advisory functions. Applicants should preferably hold a degree or similar, and have appropriate experience.
Further details and application form available from Building Of. Five, Leicester Polytechnic, P.O. Box 142, Leicester LE1 9RH.

CAPITAL APPRIS.
COMPUTER
SERVICE
ENGINEERS
Please for free leaflet
SHAW-WATSON
017 5551 day, 945 0668

Systems Analyst

Large International Bank
Salary: c £6,000 plus mortgage subsidy

Initially, this position will be based in Frankfurt and London and the successful applicant will be expected to commute for approximately 6-8 months to Frankfurt on a weekly basis. Thereafter, the position will probably be based in London.

We are looking for a person who may now be working as a Systems Analyst or as an Analyst/Programmer and who is looking for a position which offers a more interesting career step. A logical and organised approach to work is as important as a technical background. Experience in the use of File Structures and Design, Information Retrieval Techniques and File Access methods would be a considerable asset, as would a knowledge of mini computer equipment. A knowledge of banking practices would be an advantage although this is not essential.

His or her first assignment will be to set up and maintain a system to control data definition and their use within our client's computer system. In the longer term, it is intended to maintain data definitions on a computer based Data Dictionary and to use this as the major reference source and control. He or she will be responsible for establishing and controlling this interface also.

The position is an extremely important one with considerable responsibility, and is based within a successful and dynamic systems environment.

Please contact John Goldsmith quoting reference no. 859.

WE ARE ALWAYS INTERESTED IN HELPING YOU WITH YOUR CAREER

Computing
Services
Association

John Goldsmith
(Computer Recruitment) Limited,
15 Buckingham Palace Road, London, SW1.
Tel: 01-828 6366 24 hour answering service.

JOHN GOLDSMITH
(Computer Recruitment) Ltd.

CONTRACT UK

High Income Contracts through R.T.Z. Computer Services.
Qualifies and experienced personnel required with knowledge of financial systems, interactive or database technology.
Languages COBOL, PL/I, FORTRAN, BASIC or Assembly level.
Mini or mainframe experience required.
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R.T.Z. Computer Services Limited,
103 Jermyn Street, London, SW1Y 6H.

RTZCS 01-930 4163

William Key & Partners Limited

COMPUTER SYSTEMS ENGINEER MANCHESTER

KRATOS Ltd manufactures the DS60 and DS300 ranges of data systems which provide real time processing of data generated by scientific instruments.

KRATOS now needs a COMPUTER SYSTEMS ENGINEER to be responsible to the Data Systems Product Manager for the specification, procurement, checking and installation of the system hardware.

Applicants for the post should have:

- * Sound knowledge and practical experience of mini-computers using high level operating systems.
- * Minimum of 2 years' experience of installation and/or commissioning.
- * A degree or equivalent in Computer Sciences.

A competitive salary is offered.

William Key & Partners Ltd. have been retained to fill the above post. Please write with brief details or telephone for an application form: Liz Segal, William Key & Partners Ltd., 804/808 Com Exchange Buildings, Corporation Street, Manchester M4 5DD. 061-234 2271 during office hours, or 061-234 5486 at other times. Ref: GW 8508.

BOROUGH OF HYNDURN Borough Treasurer's Department

COMPUTER PROGRAMMER
AP.2/3 £2529-£3282 + £312 salary supplement.
+ phase 2 supplement

The Council operate an ICL 1901A with tapes and discs. Candidates must be experienced in COBOL.

Assistance will be provided with removal expenses, and provision of housing accommodation, in approved cases.

Application forms and job descriptions available from the Personnel Officer, Town Clerk's Department, Municipal Offices, St. James Street, Ashington, Lancs. BB5 1PQ. To whom they should be returned not later than 7th November 1977. Ref. 141.

Consent of Senior Officers of Members of the Council will automatically be given.

ANALYST/PROGRAMMERS

Head Office Development for Overseas Branches
Circa £6000 plus benefits

Lloyds Bank International requires additional analyst/programmers for its overseas development and support group within its Computer Services Department, based in the City, to work as part of a small highly skilled team.

The job is to assist in the development of generalised Banking Computer Systems which are to be installed on IBM System 32 and 34 computers in overseas branches of L.B.I. The work will be carried out in London but opportunities for overseas travel may occur from time to time.

Ideally candidates will be in their mid-twenties, be well educated, probably to at least 'A' level standard and should have had at least four years' experience either as a programmer or analyst/programmer preferably using IBM System 3 or 32 computers in a banking environment.

The starting salary will reflect age and experience but it is unlikely that anyone currently earning less than £4500 would have the desired qualifications and experience. The position offers very good career prospects.

Interested applicants should write or telephone, stating qualifications and experience, to Simon Wootton, 01-248 9922, Ext.338

LLOYDS BANK INTERNATIONAL
40 66 Queen Victoria Street, London EC4P 4EL

THE UNIVERSITY OF SHEFFIELD

UNIVERSITY COMPUTING

CHIEF SYSTEMS PROGRAMMER

Grade 11: £5425-£6585 a year.
Applications are invited from men and women who are graduates for the above post, suitable as soon as possible. The successful candidate will lead a team of 14 systems programmers. Experience in systems programming, development of systems programming and management of other programmers required. Salary scale as quoted above plus superannuation.
Penclose form from the Registrar and Secretary, The University, Sheffield S10 2TN to whom applications if closed should be sent by 11 November 1977. Please quote ref. R44/78B

The Polytechnic of North London

LONDON POLYTECHNIC COMPUTER UNIT

Systems Programmer or Senior Systems Programmer

The hardware ICL 1905 (1906) with data and magnetic tapes, cards and paper tape, graph plotter, 7020; plus access to a line-11.
The software: George 2, Fortran, Algol 68, Cobol, Plan, Algol 68, etc. and application packages.
The job: Software maintenance and enhancement, user support on both computers, documentation, applications programming, hardware and software evaluation.
Qualifications: Degree or professional equivalent. Familiarity with 1905 or Dec-10s and experience with micro-processors would be an advantage.
Salary: On scale up to £2288 for a Programmer and up to £2008 for a Senior Programmer (including London Weighting and savings supplement) depending on previous experience.
Further details and application form from Head of LPCL, Polytechnic of North London, Holloway Road N7 8DB

oxford polytechnic

Department of Mathematics
Statistics and Computing

LECTURER/SENIOR LECTURER in DATA PROCESSING

Salary £2,744 - (£3,700)

To teach Data Processing and Systems Analysis on BSC and DDP-11s. The successful candidate will be responsible for the development of the Department of Data Processing and Systems Analysis, and for the recruitment and training of staff.

Please contact: P. Gwynn, PLOUGH (UK) LTD, 100 High Street, London SE11 7TR. Telephone 01-439 4363

THE SALES BIT

Watch your tongue

TRAVELLING AND DINING with colleagues and clients often presents an excellent opportunity for discussing important business matters. Perhaps the implications of the new equipment you are about to install; the opening of a new branch office; the highlights of your prospect portfolio; or the details of an important proposal.

Unfortunately, whether travelling first or second class, dining at the Ritz or Joe's Caff, there is no way of assessing whether you are in the company of disinterested bystanders or fascinated competitors.

Several years ago a friend of mine, and a significant personality within the history of the UK computer industry, needed to buy air conditioning equipment for a substantial installation.

During the journey to London my friend was intrigued to overhear the conversation of two men who were leaning over a large blueprint on the table opposite.

They were discussing their tactics for a forthcoming meeting. What they would say when they arrived, who would handle what aspects of the conversation, their opening and bottom prices, making such remarks as "We'd better not mention that" and "That's not as good as it might be."

Later that day my friend saw the first of the contenders for the new air conditioning equipment, and who should be their representatives but — you guessed it — the two men on the train! Right, and you guessed it again! They didn't get the business.

The implications of having business conversations overheard are fairly obvious; yet people continue to do it, both senior and junior personnel alike, even though such carelessness could easily result in the loss of a forthcoming sale or an existing client.

So, if you must discuss your business publicly, keep it quiet, use no proper names of companies, products or personalities, and make it brief.

Conversely, if you are travelling or dining alone just listen to the world around you. The loose talk of other people is fair game.

And next time you visit the pub with the lads from the office, just think about all those clients, potential clients, competitors, journalists, recruiting agents, government officials and divorce detectives who might be in there with you.

Trader

Puzzle answer

GIVEN one side x of a right-angled triangle, and the difference d between second side and hypotenuse, then

$$x^2 = d^2 + 2dy$$

where y is the second side. This makes AC 25.5 in our particular case.